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The Maturing of the MOOC

LITERATURE REVIEW OF MASSIVE OPEN ONLINE
COURSES AND OTHER FORMS OF ONLINE
DISTANCE LEARNING

SEPTEMBER 2013

RESEARCH

The views expressed in this report are the authors' and do not necessarily reflect those of the Department for Business, Innovation and Skills.

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Executive Summary

This survey of MOOC and ODL literature aims to capture the state of knowledge and opinion about MOOCs and ODL, how they are evolving, and to identify issues that are important, whether consensual or controversial.

The headlines

Conflicting perspectives on MOOCs divide education communities

Elite institutions in The Academy, primarily leading US universities, are widely engaging enthusiastically in MOOCs by lending brand, content, funds, staff, badging and policy support. They see opportunities for brand enhancement, pedagogic experimentation, recruitment and business model innovation. (*A few have actively disengaged (Duke, Amherst) but these are a minority.*) The pro-MOOC impetus is producing **a conspicuous literature**. It reports positively on these experiments, describing a process of maturing, expansion and deepening. There are dissident voices in the elite institutions, however, and the arguments they are assembling against MOOCs remain strong and vocal.

Smaller or less prestigious institutions have not so far engaged strongly with MOOCs, either through lack of appetite, lack of capacity, or lack of opportunity. Often, smaller players who have considered the MOOC issue have sounded alarm bells – they see threats of being left behind, of losing market share and recruits. They also charge that MOOCs are unable to serve learners with more complex learning needs. Although such perspectives would appear to represent the position of the vast bulk of post-16 educational activity, the **sceptical literature reflecting these concerns is less visible** and less extensive.

Learning Practitioners disagree about the value of MOOCs

Learning practitioners have engaged by contributing **extensive critical review literature in peer-reviewed journals, the specialist educational press, blogs, and the general media**. Two conflicting strands of opinion run in the critical practitioner literature.

1. A strand of enthusiasts welcomes the shake-up and energy MOOCs bring to learning, teaching and assessment. They report positively on learning experiences and innovative formats of pedagogy, and spotlight themes such as access, empowerment, relationship building and community. This strand is particularly prevalent in the general press. Examples include Shirky and Legon.
2. A strand of sceptics tempers the general enthusiasm along two themes:
 - The supposed benefits of MOOCs were already realised in previous generations of ODL innovation – and the innovations of MOOCs are the victory of packaging over content
 - The MOOC format itself suffers from weaknesses around access, content, quality of learning, accreditation, pedagogy, poor engagement of weaker learners, exclusion of learners without specific networking skills.

Formal comprehensive analyses of MOOCs mostly concur that they are disruptive and possibly threatening to current HE models

National and international authorities, research brands, think tanks and professional bodies have actively commissioned formal expert appraisals and overviews of MOOCs. There is often a brief to explore issues of national strategic importance. The focus of these overviews is more the Universities, than the learners.

This literature, typically **more impartial and comprehensive** than the other types, tends to acknowledge (with a few exceptions) that MOOCs bring an impetus of reform, research and innovation to the Academy. All reports foresee **dramatic imminent change** as a result. Some suggest, however, that the MOOC proposition lacks novelty, and the scale of MOOC impact, along with its potential to transform Universities, may be over-hyped. This literature detects failings in the MOOC format around sustainability, quality, equality, equity, financial viability, learning quality and accreditation. However, it also reports initiatives to address them, and consistently identifies MOOCs as a tipping point for HE.

Reporting of MOOC learner experiences is positive

Learners who have completed MOOCs emerge from the literature as relatively **enthusiastic** about the MOOC format. Different kinds of learner experience have been identified, and passive consumption or lurking in a MOOC is a common pattern. The consensus is growing that lurking and auditing have validity as a learning activity within MOOCs, and that non-completion is not a significant problem in this learning format. The benefits of MOOCs to learners come in the form of access to high quality material, and new kinds of collaborative learning experiences in some types of MOOC. Most studies show that the MOOC experience demands skill and aptitude in online social networking, and that these baseline capabilities are not widely enough shared for MOOCs to present a realistic format for many learners. Credit does not appear to be a major motivation for learners who have chosen MOOCs so far; however, there are clear signs that this will change.

The MOOC is maturing – and engaging with its business and accreditation issues

The Burning Issue in the MOOCosphere is the **search for business models** – and all the associated sub-issues of scale, sustainability monetisation, accreditation for MOOC learning and openness. Our report focuses in depth on analysis of this topic in the literature. The survey suggests that after a phase of broad experimentation, a process of maturation is in place. MOOCs are heading to become a significant and possibly a standard element of credentialed University education, exploiting new pedagogical models, discovering revenue and lowering costs.

Literature Summary

Our report methodology has assessed over a hundred known recent literature contributions on MOOCs and ODL. One hundred of these have been indexed in tabular format. Fifty have been summarised. In a critical literature review citing over a hundred authors, we have reported on the main issues around MOOCs as identified by the literature. In view of the level of controversy, and the different approaches of different types of literature, we have divided the MOOC literature into three classifications:

1. Contributions by individual authors on MOOCs which are often polemical and even parti-pris. These cover MOOCs from the perspective of institutions, and learners
2. Formal and comprehensive surveys carried out with methodological approaches
3. General press writing and journalism.

The overview literature contributed by informed writers covers the MOOC phenomenon from two distinct perspectives: its impact on education institutions, and its impact on learners.

Whether **the MOOC is a welcome or a threatening prospect for HEIs** divides informed writers. There is consensus that MOOCs, correctly deployed, do offer education institutions a useful lever for restructuring and transition. On balance, the literature expresses the view that MOOCs will probably not threaten traditional forms of University teaching in the short term, but a significant sub-group of credible writers foresees wide and sudden changes and disruptions to HEIs from MOOCs.

Learners' experiences in MOOCs are examined in literature, both through statistical analysis and anecdote. The statistical approach has yielded insights about different types of learner behaviour in MOOCs, creating a distinction between learners who are “auditing”, “sampling”, “disengaging” and “completing”. Statistical analysis has also captured a trend of diminishing learner participation in MOOCs over course durations. Writers assess MOOCs as challenging environments which can discourage or disorientate many learners, as witnessed by the low percentages completing. However, the literature also shows that mere completion is not a relevant metric, that learners participate in many valid ways, and that those who do complete MOOCs have high levels of satisfaction. There is as yet no agreed satisfactory system of measurement for assessing the quality of MOOCs from the learners' point of view.

Formal analytical reporting of the MOOC issue almost invariably diagnoses MOOCs as potentially disruptive and likely to threaten existing practices. With the exception of Canada's early “MOOC Model” report written in the optimistic moment of the first cMOOCs, authorities who commission or produce systematic MOOC analyses receive variations on the same conclusion: MOOC formats will pose huge challenges for existing HEI business models, for institutions at all levels, for pedagogy, and for international education.

Analyses vary in the amount of positive energisation they discern alongside these disruptive elements of MOOCs. At their most benign, MOOCs may drive innovation and experimentation, leading to improved learning and lower costs and a managed restructuring. At their most ferocious, MOOCs will force many HE players to radically transform themselves, or die if they fail to adapt, and a chaotic rout of the sector is in prospect.

Challenges for learners also emerge as a consistent thread of analysis. There will be benefits in terms of flexible pathways and accessible affordable learning. However, the literacies and skills required to benefit from MOOCs are very specific, and existing educational curricula may be unsuited.

Journalistic writing is significant for this topic, because popular discourse in mainstream media titles is shaping the MOOC trajectory. Public attention creates a bubble

of hype and a “must have” factor, which may be contributing to a herd mentality and a stampede to produce MOOCs.

Positively-spun press articles hail MOOCs as the hi-tech engine of a transformative revolution that will remake education as a highly engaging, open and low cost activity.

Critical journalism decries the hype surrounding MOOCs and claims that their benefits are illusory, and that in reality MOOCs harbour undesirable and inappropriate behaviours.

Clear numerical evidence of the balance between these two opposing “spins” of press coverage is hard to obtain. However, anecdote, observation and a count of search query returns suggests that the proportion of negative commentary may be rising.

The burning issues for MOOCs are the exploration of a viable business model and the accreditation of MOOC learning.

The maturing of the MOOC format is attested to in the literature by analysis of an emergent (and still incomplete) picture of MOOCs’ falling costs and growing revenues. Whether this adds up to a viable business model is being tested with a new generation of low-cost accredited degrees based on MOOC principles being prepared by some leading US colleges.

Accreditation is discussed in the literature mostly to the extent that it offers a route to revenue for US MOOC platforms and possibly for colleges. This debate has not been seriously applied to the UK yet – but there is every reason to expect it will come.

For the time being, discussion of the models for assessing learning, which would be essential to credentialed outcomes, is not highly developed. However, some new potential methods, specific to MOOC technology, are starting to emerge.

Some specific issues for MOOCs in HE and FE are handled in separate sections:

- Education theory: are MOOCs an innovation or a continuation of prior ODL
- Futurelearn – the UK MOOC platform: what will it offer
- FE – can the sector profit from the maturing of MOOC formats
- Completion and drop-out rates and metrics for MOOC quality
- Technology evolution: how will learner analytics develop to enhance MOOCs

The MOOC skillset – what skills will a MOOC-shaped world require? **The extent to which MOOCs are a genuine innovation**, or a mere repackaging of prior heritage in open learning, is a significant theme in the academic literature.

Overall, we see that a wide range of views obtain on this topic, with many competing theories and models advanced to account for different pedagogical models.

Futurelearn’s CEO Simon Nelson in a primary research interview talks about how the UK platform will combine MOOC and non-MOOC elements.

The literature on MOOCs and FE is sparse. However, primary research shows that the UK FE sector is adequately aware of the issue. Educational experimentation and development of online pedagogy is, however, taking other non-MOOC tracks for the time being. Marginal uses, for example in FE teacher development, look well established. The US community college sector shows ways in which FE might exploit MOOC opportunities. These involve partnership with MOOC-producing HE.

On MOOC drop-out rates, authors argue from a variety of perspectives that the high crude drop-out rates of MOOCs are an irrelevant issue, despite the frequent reference to these numbers in popular discourse. Reasons include the high drop-out rate in many types of learning, and the evidence that with no penalty for exit or entry, lapsing from MOOC enrolments is simply not a significant decision.

Learner analytics technology, already theorised and explored in a mature and established debate rooted in the ODL literature, comes to its full potential with the scale and mechanisation of MOOCs. Applications will enable students to be served more engaging material based on their individual profiles. Adaptive learning is a real possibility. Interventions can be targeted to secure completion.

The networking, reputational and learning skills that MOOC environments require for successful learning are an important issue for many writers. Online autonomy, group formation and inclusion/exclusion feelings among learners are a vital dynamic in MOOC learning, and are probably insufficiently understood. It is also likely that primary and secondary education curricula are not addressing these learning skills adequately.

MOOCs demand policy and research responses from policymakers

The report finally surveys the literature around research and policy development on MOOCs, and uses this to recommend further actions.

- Research initiatives for BIS to respond to the maturing of MOOCs involve understanding their **disruptive potential** in HE, and their trajectory of **technical development**.
- Policy Development opportunities are around **accreditation**, the role of MOOCs in delivering **CPD**, and **pedagogical innovation**.

An annexe delivers and oversees MOOC roundup covering Europe, Asia and the Developing World.

The Bibliography of over 100 items contains links to every piece of literature reported and discussed.

Authors

The main writer of this report is Stephen Haggard. He is a former Production Executive in the BBC-Open University partnership, and the creator of the current BBC-Open University strategy for open access distance learning. He has worked as an independent consultant in e-learning since 2006. His clients range from UK HEIs such as HEFCE, Cambridge and London, to a wider and global online education agenda with UNESCO, Education Scotland and Beijing Normal University. He also consults on digital strategy and technology with commercial brands ranging from Coca Cola to JustGiving and from TBGDigital to the National Media Museum.

Declaration of interest: two current clients have businesses which might potentially touch on the following areas covered in this report: international partnerships, developing world online education. However there is no actual overlap, and these companies and their interests, activities, products and partners are not covered anywhere in this report.

Two specialist organisations have provided further expertise and specific knowledge.

The Centre for Distance Education (CDE) is a University of London International Programmes initiative to promote collaboration, knowledge-sharing and best practice in distance education and e-learning throughout the University of London and beyond. Full details of the CDE's outputs, including research, events programme and Fellowship activities, can be found at www.cde.london.ac.uk. Contributors to this report from CDE are Tim Gore and Tom Inkelaar. Research Fellows from the CDE (Professor Stephen Brown, Roger Mills, Professor Alan Tait and Professor Steven Warburton) have also reviewed this report and supplied comment and review.

The Observatory on Borderless Higher Education (OBHE) is a higher education research and monitoring unit within the International Graduate Insight Group (i-graduate). It conducts research and disseminates timely information and analysis on trends, policy frameworks and the full range of international higher education activities at both institutional and governmental levels around the world. Contributors to this report from OBHE are Dr William Lawton and Alex Katsomitros.

Further contributions were as follows:

Additional research and bibliographic support: Patrick Alcantara

Project support: Teresa Angulo, OBHE

MOOCS – the cribsheet

This section of the review sets out to outline briefly the factual background to MOOCs, before exploring the way that literature has covered the topic. Specialist terms are glossed here.

Massive Open Online Courses (MOOCs) is the term which emerged in 2008 for a particular type of open online course format. MOOCs have quickly gained popularity, expanded, and evolved.

What a MOOC actually is, as a learning format, provides a challenge for definition.

Descriptively, a typical MOOC course of 2013 might take place over 4 to 10 weeks, of which most are given to learning and a final week or fortnight to production of a piece of work, sometimes a video. Students on average estimates dedicate two to six hours a week to the course although a small cohort of highly engaged learners may be much more committed. Materials are consumed in diminishing volumes throughout the MOOC as many learners' commitment wanes. The resources posted in the MOOC remain accessible after it has closed. Course applicants can be numbered in the tens of thousands, while those who complete and obtain certificates are usually numbered in the hundreds, or a few thousand at most.

Historically, it is an evolution of previous experiments in open education and online learning. Other antecedents include the movement for Open Education Resources (OER), and earlier pioneering experiments in distance learning technology. The heritage matters for three reasons. First, these origins may reveal that the MOOC is, or is not, a genuine educational innovation. Second, if the innovations emerging from MOOCs are connected to the other recent learning practices, the benefits of MOOC formats will be widely shared. Third, the history of distance learning shows earlier cycles of online innovation and popularity which have not ended happily: the dotcom boom saw optimistic commercial ventures such as Fathom, AllLearn, Universitas 21 and others promising provision and quality of education. These have either folded, or stepped back from their original aims. MOOCs may be subject to the same factors and could be, like these, a flash in the pan.

Functionally, the basket of products carrying the MOOC label is now quite diverse. The term applies to any course offered free, online and at scale. What marks the MOOC out from conventional online learning is that no professional academic time (or virtually none) is allocated to guiding or supporting individual learners. Some aspects of some MOOCs are now charge-bearing (such as credit-bearing examinations) and this trend is spreading as MOOCs begin to offer accredited learning.

Two classes of MOOC exist side by side for the time being, in a distinction observed by all participants and commentators: the cMOOC and the xMOOC.

cMOOCs (C for “connectivist”, the educational theory that inspired them¹) run on open source learning platforms and are led by academics as part of their university activity. Their pedagogical model is peer learning. These are associated particularly with their founding institutions Abathasca and Manitoba Universities in Canada.

xMOOCs are online versions of traditional learning formats (lecture, instruction, discussion etc.) on proprietary specialist software platforms owned by private enterprises. They feature contractual and commercial relationships between Universities who create content, and technology providers. These are associated mostly with the three largest platform providers edX, Udacity and Coursera. The UK’s FutureLearn, scheduled to launch autumn 2013, will be in this group.

An editorial comment about this distinction, from the UK’s JISC-CETIS report, is worth citing for the additional depth it brings to this description:

*“cMOOCs emphasise connected, collaborative learning and the courses are built around a group of like-minded individuals’ platform to explore new pedagogies beyond traditional classroom settings and, as such, tend to exist on the radical fringe of HE. On the other hand, the instructional model (xMOOCs) is essentially an extension of the pedagogical models practised within the institutions themselves, which is arguably dominated by the “drill and grill” instructional methods with video presentations, short quizzes and testing”.*²

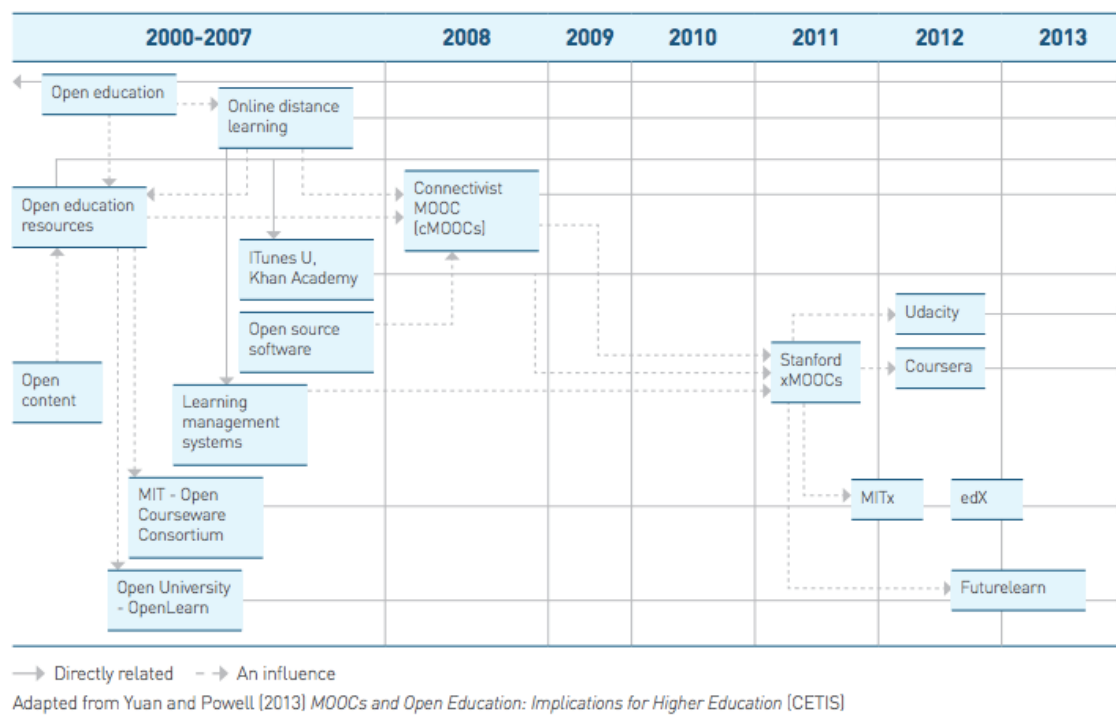
The timeline below captures the extent to which MOOCs are still an emerging phenomenon. There is organisational instability in the sector, with partnerships being rapidly forged and broken. The business models and products of the main players are not established, and have little common ground. Crucial issues such as whether the MOOC learner experience is worthy of accreditation, are yet to be settled.

¹ Connectivism is a theory of learning which emphasises the extent to which knowledge and skills emerge from connections experienced between different domains of activity such as experience, learning and knowledge, as well as between individuals in a social network. It foregrounds learners’ exposure to social and cultural experiences, rather than their exposure to didactic transmission or self-directed enquiry. It is closely associated with educational theorists such as George Siemens. Wikipedia defines it at <http://en.wikipedia.org/wiki/Connectivism>

² <http://publications.cetis.ac.uk/wp-content/uploads/2013/03/MOOCs-and-Open-Education.pdf>

Figure 1: MOOC Timeline

(with acknowledgement to UniversitiesUK)



The consensus points on MOOCs are their importance, popularity and expansion. There is consensus on the reasons that Universities, and learners, have for engaging in MOOCs. These are: brand extension, recruitment, educational innovation and revenue (or cost reduction) opportunity. Learners mostly report satisfaction from studying in MOOCs, and curiosity about the experience. MOOC learners are not (currently) looking for awards.

That the impacts of MOOCs on HE will be profound and enduring is another consensus point. There is disagreement over whether a MOOC-induced transformation of the education landscape would be destructive or creative, and who might be the winners and losers. The possibility exists (for a minority of authors) that a Gartner Hype Cycle³ may be at work in the MOOC phenomenon – in which case the potential impacts may be overplayed.

Controversial points about MOOCs are just as important as the consensus. The field provokes some vocal and emotive polemic. This can directly influence its trajectory, with some Universities changing tack abruptly in the wake of strong opinion. The xMOOC format, which is where recent massive growth has taken place, is the subject of intense comment and speculation in the Academy and Press. Strong commitments from top university brands, stoked by large venture capital investments, have cooked up a powerful

³ The Gartner Hype Cycle is a proprietary methodology from Gartner Research, widely adopted elsewhere, to account for large fluctuations in optimism and consolidation in technology-based industries. A technology trigger leads to inflated expectations, which are then followed by heavy consolidation before the sector reaches a stable plateau. See <http://www.gartner.com/technology/research/methodologies/hype-cycles.jsp>

and frothy brew. A tonic for an ailing education system say some, a poison for Universities say others. Adverse comment decries the xMOOCs as hype, or mutton dressed as lamb, and questions their sustainability and the value of the learning achieved in them.

The prevalent opinion is that, whatever their faults, MOOCs herald an unstoppable “Napster moment” which will break the old business model of Higher Education in the same way that the Napster downloading site provoked the collapse of the traditional music industry business based on copyrights.

Specialist terms

The MOOC discussion deploys some unfamiliar terminology:

Term	Explanation
Connectivism	A theory of learning emphasising how knowledge and skills emerge from making connections between different domains of activity such as experience, learning and knowledge, as well as between individuals in a social network. It foregrounds learners’ exposure to social and cultural experiences, rather than their exposure to didactic transmission or self-directed enquiry. It is closely associated with educational theorists such as George Siemens. Wikipedia defines it at: http://en.wikipedia.org/wiki/Connectivism
“Flipped classroom”	The practice of using education technology to impart core learning, leaving the classroom as the locus for coaching, mentoring and peer interaction. A model originating in Harvard in the 1990s, and increasingly adopted in University teaching. Wikipedia defines it at: http://en.wikipedia.org/wiki/Flipped_classroom

Overviews of widely quoted numbers

MOOC platform, country	Quoted student numbers (date of announcement)	Number of courses (as of 28/5/13)	Number of institutions
Coursera, US⁴	3,670,803 (on 28/5/13)	374	70
EdX, US⁵	900,000 (approx. May 2013)	53	27
Udacity, US⁶	400,000 (approx. May 2013)	25	1
FutureLearn, UK⁷	N/A	N/A	21

UK institutions MOOCs	Students	Courses
University of London International Programmes	165,000	4
University of Edinburgh⁸	308,000	6

⁴ Accessed on 28/5/2013: <https://www.coursera.org/>

⁵ <http://bostinno.streetwise.co/2013/05/21/edx-partners-with-15-more-schools-including-boston-university-and-berklee/>

⁶ <http://en.wikipedia.org/wiki/Udacity>

⁷ <http://futurelearn.com/>

⁸ <http://www.timeshighereducation.co.uk/news/how-was-it-the-uks-first-mooc-assessed/2003218.article>

Methodology

The literature on MOOCs presents risks, according to Sir John Daniel, who says much writing on the subject is “*thinly disguised promotional material by commercial interests (e.g. Koller, 2012) and articles by practitioners whose perspective is their own MOOC courses*”⁹. Commercialisation and corporate interest is part of the development trajectory of MOOCs, and with this goes a noisy literature of self-promotion, press hype, diatribe and commercial posturing. We have included, but contextualised, these slanted contributions when discussing them.

Our methodology responds to the issue of perspective in the literature, by distinguishing and separating two different kinds of content.

1. Critiques offered by informed individuals. This category includes:
 - academic research articles
 - blog posts
 - essayistic commentary
 - journalistic coverage in general and specialist media.
2. Formal comprehensive reviews commissioned from teams of expert writers by authoritative bodies.

Infographic overviews of MOOC and MOOC issues are another relevant literature form through which discussion and evaluation progresses, and we have included examples of such content.

Our literature selection method was:

- Consulting the bibliographies of recent academic articles on topics such as online learning, MOOCs, and university reform from credible institutions and journals
- Tracking references and links in articles by credible writers
- Subscribing to updates and posts from specialist journals and blogs of Education, Technology and online learning
- Searching the terms such as MOOC, MOOCS, online learning, ODL, Coursera, Udacity, edX in search engines and in the search function of specialist journals and blogs.

Then, in consultation with all members of our team, we have processed the results of this selection towards two different outputs.

⁹ <http://jime.open.ac.uk/2012/18>

1. A comprehensive list of 100 items of literature which are inventoried and sourced; written summaries have been produced of half.
2. A report based on a thorough analytical reading of all the literature, referring to over a hundred sources, but with an extensive citation and critical focus on around 25 most significant articles.

Report Structure

The report output of this project is divided into three sections.

- A. An **overview** section in which we assess all the literature from various sources. In this section we observe the distinction (see above) between formal comprehensive reviews of the whole MOOC scene commissioned by authoritative bodies on the one hand, and the critiques that come from informed contributors responding to specific issues and elements within the MOOC phenomenon
- B. An **issues** section in which we analyse in depth a set of crucial topics as reflected in the literature. These are the two most intensively discussed problems of MOOCs (accreditation, business models) plus a number of specific issues which raise particular concern for the UK policy agenda (FE, MOOC skills, Futurelearn, etc.)
- C. Recommendations for **Policy Development and Further Research**.

MOOC developments outside US and UK are handled in an annexe – although this should not be taken to imply less relevance. On the contrary, MOOC adoption has huge impacts for the Developing World.

Exclusion Criteria. We have excluded:

- Unprocessed commentary from online forums
- Comment from MOOC participants submitted within MOOC courses
- Commentary articles from occasional writers without a professional or sustained interest in the topics of MOOCs, online education, or Academy reform
- Education press reporting of news stories without analysis eg *“University X launches MOOC on topic Y”*, *“College A signs up with MOOC platform B”*
- Material published after Friday 3 May 2013. This has not been tracked systematically and is referred to only if and when it has come to our attention incidentally, and merits attention.

Primary and Secondary Sources

The evolving, commercial, and sometimes unpublished nature of the topic means we have selectively undertaken some primary research by speaking directly on occasion to major players. This is the case in our coverage of UK FE, UK MOOCs from Edinburgh University, and FutureLearn, none of which are adequately covered in literature.

Part One: Overview of informed critiques

The critical literature about MOOCs is informative and vast. Different kinds of literature respond to MOOCs in different ways.

In this section we consider the literature of informed critiques. By this, we mean literature produced spontaneously **by individuals** (as opposed to literature commissioned by Governments, Think Tanks, Research Surveys etc., which are covered separately). These writers invariably have direct involvement in MOOCs and other forms of online education, either as course participants, course producers, or academics in MOOC-delivering institutions, or as informed observers writing in specialist and general press.

Arguably the writing of informed critiques by interested participants is the prime channel in which opinion and evaluation on MOOCs emerges and takes shape.

For the purpose of analysis, we divide it as follows:

- a) Literature about HEIs. This is writing that reflects institutional perspectives and focuses on **MOOC production** and what MOOCs mean for the Academy
- b) Literature about learners. This is writing that reflects MOOC student perspectives and focuses on **MOOC consumption** and what MOOCs mean for learners
- c) Journalistic literature from writers working for media brands and aiming to report the phenomenon from the perspective of general or specialist interest.

A note on MOOC classification and typology of MOOCs

Writers concur that MOOCs have evolved through several stages in the five years since the term first appeared. Literature tracks the shift of the prime concern of commentators, from educational innovation, to the search for a viable business model.

There is consensus in the literature on a typology for two different incarnations of MOOCs.

- The original MOOCs formed out of Athabasca and associated with Connectivism, Canada and George Siemens are variously denominated Connectivist MOOCs, cMOOCs, Canadian MOOCs, or MOOC 1.0.
- The second generation of MOOCs launched by elite US Universities, and the venture-capital funded platforms they have spawned, are variously known as xMOOCs, MOOC2.0, or, increasingly, as they have commanded headlines, as just MOOCs.

Literature on HEIs and MOOCs

In this section

Informed writers from within the Academy engage in heated debate about the significance and impact of MOOCs for HEIs.

The consensus is that MOOCs do not immediately threaten the continuation of traditional Higher Education in campus universities offering face-to-face teaching. However, MOOCs will increasingly alter the educational landscape.

A dissenting and significant minority view from inside the Academy takes a more alarmist stance. MOOCs announce an imminent process of “disruptive innovation” and will cause immediate pain to existing HE players.

Literature addressing MOOCs from the perspective of HEIs considers the pros and cons of MOOCs for the University, assesses the problems of MOOC production and delivery, forecasts MOOC impact on University models, and analyses trends.

Often, the writers are *parti-pris* and argue in favour of or against the MOOC phenomenon. The readership typically engages and develops the theme online in responses across the blogosphere.

This literature format provides by far the largest and most up-to-date body of content on MOOCs from the HEI perspective. It is best considered as an ongoing debate among practitioners, in which opinion, analysis, polemic, data and reporting all mix together.

Typically this kind of literature will:

- Rehearse the recent history of the MOOC phenomenon. Reference points are themselves contested. Authors sometimes note the emergence of MOOCs from earlier ODL cultures, the first MOOC in 2008 (consensually named as a course on Connectivism from University of Manitoba, led by David Cornier, but other versions of the history are told). More recently, they start the story with the launch of platforms backed by venture capital and content from US elite universities in 2011.
- Cite the principal reasons why Universities may engage with MOOCs: Reputation, pedagogic exploration, widening participation and sharing experiences with peer Universities.
- Make forecasts. Writers assess the emerging issues, and look forward optimistically or pessimistically to the possibilities that may emerge from MOOC development.
- Base content on specific MOOCs or recent developments.

The current balance of prognosis from informed writers from within the Academy is that MOOCs do not immediately threaten the continuation of traditional Higher Education in campus universities offering face-to-face teaching, but that they will increasingly alter the educational landscape. However, more apocalyptic views are also voiced inside the

Academy. These suggest that MOOCs will trigger a period of “disruptive innovation” and cause immediate pain to existing HE players.

We offer a representative selection of contributions from academics or practitioners, writing about MOOCs from the HEI perspective, to sample the spectrum of positions taken and also to give a balance of geographies and formats. We have not included writing here from any members of the MOOC-producing companies, which may be sampled on company websites, and which is more properly categorised as advertising and PR than critical literature.

Positive:

Clay Shirky

Ron Legon

Simon Shocken

Critical:

Sir John Daniel

John Casey

Balanced:

Michael Gaebel

Tony Bates

We review this literature in detail below.

Positive

Clay Shirky, a prominent online polemicist and NYU professor, develops a MOOCs controversy at his article *Your Massively Open Offline College is Broken*¹⁰, in response to attacks to the critical blog posting he made identifying MOOCs as the “Napster moment” for Higher Education¹¹.

Shirky argues that MOOCs should be seen as a reasonable response to the failures of the US Education system. Looking at the post K-12 learning options pursued by 17 million US students, at community colleges and run-of-the-mill Universities, Shirky decries a deteriorating system featuring up to 50% dropout rates, gruesome attendance schedules, and heavy debt for students as its main product. Many online degrees, especially those scheduling strategic face-to-face learning in small doses, are simply a better deal, argues

¹⁰ <http://www.theawl.com/2013/02/how-to-save-college>

¹¹ <http://www.shirky.com/weblog/2012/11/napster-udacity-and-the-academy/>

Shirky. In colourful language Shirky distinguishes pedagogically valid online learning from commercial online offerings which he castigates as “[bottom-feeding scum](#) like Kaplan U and Everest [...] institutions [which] are just asset-stripping student loans”.

MOOCs, says Shirky, belong in a larger story of education technology. From the microphone to the online lecture, technology innovations have allowed institutions to teach ever larger numbers of students. Colleges have reaped the benefits of falling costs and steady fee income. MOOCs disrupt this nice business, giving the Academy the kinds of challenges to its business model that publishers and travel agents have faced already. Shirky defends MOOCs as agents of necessary change, and blames the Academy for its failure to address its own problems of quality and competitiveness. Shirky interprets the reluctance of colleges to offer MOOC accreditation and degrees as the whingeing of a professional lobby fighting a rearguard action against technology and change.

Shirky was attacked for his apparent endorsement of MOOCs in an *ad hominem* blog polemic by a Literature PhD candidate, Aaron Brady, that is widely read and often cited.¹²

By way of comment on Shirky’s welcome of MOOCs as the just nemesis for a failed system, we note that it is the extreme position in a more moderate critique adopted by many other commentators. A so-called “unbundling” of US college education has been underway for some time, with functions such as student support parcelled out to commercial contractors such as Straighterline. This process is presented by the institutions which adopt it as a streamlining which delivers value and quality.

Ron Legon, Executive Director of the US Program “Quality Matters” which supplies a US quality benchmarking and certification process for online courses, endorses MOOCs from a perspective of online course quality.¹³

Contrary to Bates, Daniel, and others with their roots in the cMOOCs movement, Legon hails the xMOOCs of Coursera, Udacity, edX and others as MOOC 2.0, a worthy successor. His argument goes that the first wave of MOOCs (MOOC 1.0) was designed by faculties from elite institutions who produced a format that may be effective for the bright self-starter but is unsuited for the average or challenged student. MOOC 1.0 courses take no responsibility for learning results or for the monitoring, engagement, evaluation and accreditation of students. As such, for Legon, MOOC 1.0 is wholly inappropriate as a replacement for college-based credit courses, or as a means of expanding access to higher education or even reducing its costs.

The second generation of MOOCs (MOOC 2.0), according to Legon, focus on the typical student, integrate more effectively with established distance and on-ground programs, and lead to credentials. They will experiment with some enrollment restrictions, reachable instructors and facilitators, clarity about fees for enhanced services and evaluation, and more tangible guarantees of credit or recognition for those students who successfully complete.

¹² <http://www.insidehighered.com/views/2012/12/06/essay-critiques-ideas-clay-shirky-and-others-advocating-higher-ed-disruption>

¹³ <http://www.insidehighered.com/views/2013/04/25/moocs-do-not-represent-best-online-learning-essay>.

For Legon, the two formats are compatible but entirely different. *“MOOC 1.0 may survive as originally conceived – massive and open – as a means of sharing and exchanging cutting-edge knowledge with the best and brightest students. But the millions of more typical students, who need guidance, encouragement, and frequent feedback to achieve their academic and career goals, will still rely on the infrastructure, services, and resources of academic institutions to succeed. These are the institutions that do now and will continue in the future to educate massive numbers of students. MOOC 2.0 has the potential to add a useful tool to their kits.”*

Shimon Shocken, former Herzliya University Dean and Computer Science professor, discusses MOOCs in a 2012 TED talk about his 2005 computer science course¹⁴, [From Nand to Tetris](#), as a MOOC-like open learning innovation from before the term MOOC became current.

Shocken argues that the essential role of educators is not teaching alone. It is, perhaps more importantly, to provide environments for self-learning. In this perspective, MOOCs are potentially a radical return to an essence of education.

In a radical critique of the role of grading and success in learning, Shocken argues, citing Orwell that “mistakes are the portals to discovery” and that failure in tasks is essential for learning. If MOOC courses are undertaken for grading, they will not be useful.

Critical

John Daniel, a senior figure in Open Learning with a global perspective, and former President of the International Council for Open Education, writing in the autumn of 2012 in the Open University’s Journal of Interactive Media JIME, identifies “Myths and Paradoxes” in four aspects the xMOOC phenomenon: completion rates, certification, pedagogy and the purpose of MOOCs.¹⁵

As an observer of previous online educational fads, Daniel contextualises xMOOCs against previous learning innovations that promised to deliver radical extensions of university activity. (These include AllLearn, Universitas 21, Fathom, MIT open courseware and others: they are comprehensively reviewed in Taylor Walsh *Unlocking the Gates* (Walsh, 2011).) For analysis of the causes of their failure Daniel subscribes to the verdict of a dotcom bust inflicted on a for-profit business model that did not progress beyond “Edutainment” and therefore failed to recruit sufficient users. (For a full analysis of this period of failed online expansion, see University Business 2006 “What Went Wrong with AllLearn” (<http://www.universitybusiness.com/article/what-went-wrong-alllearn>.)

In his listing of paradoxes, Daniel berates the xMOOC promoters for hypocrisy and arrogance.

“The so-called elite universities that are rushing into xMOOCs gained their reputations in research. Nothing suggests that they are particularly talented in

¹⁴ http://www.ted.com/talks/shimon_schocken_the_self_organizing_computer_course.html

¹⁵ Daniel, J., Making Sense of MOOCs: Musings in a Maze of Myth, Paradox and Possibility (retrieved at JIME <http://jime.open.ac.uk/2012/18>)

teaching, especially teaching online. A related paradox is that these same institutions once opposed the accreditation of the University of Phoenix, claiming that online teaching was inherently of low quality.”

He further accuses MOOC promoters of a “Passchendaele” morality (implying a disregard for outcomes similar to that of World War I commanders) around recruitment, wastage and retention.

Regarding accreditation, Daniel contends that MOOC certificates are close to a “mill racket”, implying they are coining worthless currency. He asserts that other organisations with track records in accrediting online learning offer a better option for students seeking to certify attainments gained through distance classes.

Regarding pedagogy, Daniel presents evidence that all their claims to embody modern learning, xMOOC formats, Coursera in particular, deploy “*old and out-dated behaviourist pedagogy*”. What they dress up as educational innovation has a 40-year history.

The final myth deconstructed by Daniel is around MOOC motivation. He dismisses claims to a philanthropic expansion of free knowledge, and cites evidence that profit and posturing are the true motives of xMOOC builders. The claim that MOOCs spread learning globally is also debunked:

“It is a myth to think that providing not-for-credit open online learning from the USA will address the challenges of expanding higher education in the developing world”.

Daniel’s broadside, as he acknowledges, may in time be tempered by data and reviews emerging from the first generation of xMOOCs, and from improvements to pedagogy and retention. Daniel is confident that MOOCs will not evaporate like the previous bubble of online courses from elite colleges.

The two most important legacies that MOOCs will leave are, says Daniel, improving teaching and encouraging institutions to develop distinctive missions.

1. The MOOC stampede will force many institutions to focus their offers rather than competing in a race where they are outgunned by players with deep pockets.
2. MOOCs will create popular and public indices of teaching quality. This may expose the teaching weaknesses in some elite institutions. The publicity and scale of the format will oblige institutions to do more than pay lip service to the importance of teaching and put it at the core their missions. This is the real revolution of MOOCs.

John Casey, a professor at London’s Central Saint Martins School of Art reflects on the political economy of MOOCs and open education and the implication for Art and Design education in a 2012 blog post from the digital literacy blog at CSM¹⁶.

¹⁶ <http://digitalpresent.myblog.arts.ac.uk/2012/12/12/taking-care-of-business-the-political-economy-of-moocs-and-open-education/>

Citing the history of the ODL movement, Casey notes how the adoption and esteem of learning innovations is determined by social, political and cultural factors. Casey argues that an institutional lack of engagement with learning technology often hampers adoption and success, and that failures such as at the UK's e-University reflect an overemphasis on technology along with a failure to address the social and political aspects of using technology in education. In the case of MOOCs, Casey argues that economic pressure on students is driving their popularity. For Casey, Open Textbooks and Creative Commons (online free initiatives to make high quality learning materials available non-commercially to learners) are initiatives in online learning which, through addressing social political issues, create a greater impact on access to education than MOOCs.

Casey identifies economic factors as motivations for MOOC platform providers Coursera and EdX, who have created what he defines as “*a high volume low margin product*”. Looking at the commercial logic of participants such as VUE¹⁷, Casey argues that greater radicalism is demonstrated by the University of London's International Programmes, than the limited educational ambitions of the MOOC industry he identifies.

Balanced

Tony Bates, a veteran of Open Learning with a history in Britain's and Canada's Open Universities, in his influential education blog *Online Learning and Distance Education Resources* reviews the Coursera platform. Representing the core positions of the pre-MOOC distance learning community, Bates attacks Daphne Koller, the Coursera Executive and co-founder, for delivering a product which is error-ridden, fails to teach higher order skills of critical thinking and creative thinking, and does not treat students as individuals. However, Bates also praises Coursera for efforts to make thought and knowledge open.¹⁸

Michael Gaebel (EUA Higher Education Policy Unit Head), writing an article published on the European University Administration website, discusses MOOCs. His 2013 article *MOOCs – Massive Open Online Courses* is a balanced and technical overview. He defines MOOCs by the consensual features (online large courses without credit, charges or barriers to entry) and notably characterises MOOCs not as a recent or original phenomenon but rather as a step in the ongoing effort to improve higher education participation and the learning experience.

Graebel dispassionately dissects the collaboration between a third-party provider and a university for course design and management, and describes xMOOC funding (mostly venture capital). He reports the search for a sustainable business model that includes, but is not limited to, certification, assessment, employee recruitment, human tutoring, advertising and tuition fees. He then discusses other issues such as entry requirements (none), content (“real” courses corresponding to actual university offerings), drop-out (high but with actual course completion numbers significantly higher than in in-house training), and recognition (the current hesitation to award credit to course participants).

¹⁷ Pearson Vue: <https://www8.pearsonvue.com/>

¹⁸ <http://www.tonybates.ca/2012/08/05/whats-right-and-whats-wrong-about-coursera-style-moocs/>

Graebel summarises selected literature supporting and criticising MOOCs. He notes that supportive writing emphasises the “revolutionary” quality of MOOCs in advancing participation as well as ushering in a new business model that can translate to added revenue for innovating universities. He notes that detractors focus on quality issues, shallowness of learning and the primarily profit-oriented approach as shortcomings.

Graebel states the major questions about MOOCs as:

- Can MOOCs be considered as a new phenomenon that can truly revolutionise higher education, or mainly as a continuation of previous attempts at online education?
- Why have MOOCs apparently succeeded more in the United States than elsewhere?
- Is there an issue for European universities around the lack of MOOC language diversity, MOOC impact on traditional universities and the capacity of European universities to produce MOOCs?

A useful survey of the ways in which MOOCs may act as disruptive innovations comes in the paper by Lawton and Katsomitros *MOOCs and Disruptive Innovation*¹⁹. The authors argue that the disruptive nature of the technology is not found in one single innovation, but rather in the incremental effect of many changes in several areas of practice, from pedagogy to business model.

“The major innovations with MOOCs are not the elements of access to academic staff, peer interaction, wiki-style forums, and automated assessment. These are all part of the online offerings of traditional universities over the last few years. The disruptive innovations are shifting costs from students to institutions, shifting costs from students to future employers, matching students to jobs via a database or individually, and combining these with supervised, in-person exams at locations around the world.”

¹⁹ William Lawton, Alex Katsomitros - The Observatory on Borderless Higher Education
MOOCs and disruptive innovation: The challenge to HE business models
http://www.obhe.ac.uk/documents/view_details?id=929

Literature on Learners and MOOCs

In this section

Learners' experiences of MOOCs are reflected in the literature by statistical analysis of course metrics and by analysis of reports of MOOC experiences.

The statistical approach has yielded insights about different types of learner behaviour in MOOCs, creating a distinction between learners who are “auditing”, “sampling”, “disengaging” and “completing”. Statistical analysis has also captured a trend of diminishing learner participation in MOOCs over course durations. Such approaches, combined with increasing learner proficiency in online social media, promise to improve MOOC learner experiences over time.

Individual reports have shown that completing learners rate the MOOC experience positively. On the other hand, many learners find a MOOC a confusing experience, which demands high levels of online, personal, network and relationship skills in addition to subject knowledge.

The experiences of learners in MOOCs are analysed in the literature in two main ways, which we consider separately.

1. Statistics-based attempts to synthesise, analyse and numerically capture MOOC learner experiences in aggregate
2. Personal reports from individuals which report frontline experiences (often their own), and which may also be subsequently analysed by writers in a systematic way.

There is a further body of learner experience literature delivered in the form of unsystematic online rants and impromptu blog commentaries, often appended to MOOC course sites, which we have not assessed.

Statistical aggregate analysis of learner data

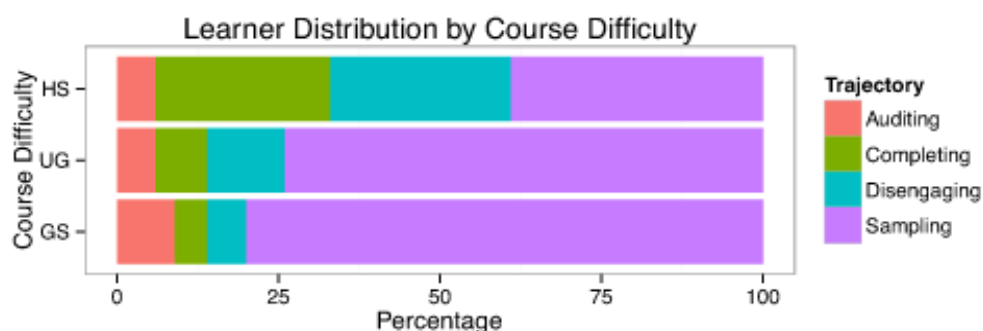
Statistical methods capture data on participation, retention and completion. Analytical studies tend to suggest that headline figures about very low completion and participation rates are something of a red herring. MOOCs demand a more sophisticated assessment than the binary completed/not completed one used in popular discourse. Beyond that simplistic variable, many valid learning experiences are being enjoyed by significant numbers of learners, and in a wide variety of ways.

Stanford’s Lytics Lab approached the problem by investigating and categorising learners through courseware analytics, to reveal more granularity in the large populations dropping out. The report²⁰ “Deconstructing Disengagement: Analyzing Learner Subpopulations in Massive Open Online Courses,” identified four significant clusters of students in three computer science MOOCs:

- “Auditing” learners watched lectures throughout the course, but attempted very few assessments.
- “Completing” learners attempted most of the assessments offered in the course.
- “Disengaging” learners attempted assessments at the beginning of the course but then sometimes only watched lectures or disappeared entirely from the course.
- “Sampling” learners briefly explored the course by watching a few videos.

Different distributions were noted across the three courses analysed (a High School, Undergraduate and Graduate School course, respectively).

Figure 2: MOOC learner types and proportions



The authors argue that the higher completion rates in the High School MOOCs related to their increased proportion of highly engaging activities, notably in-video interactions through video. If this is correct, then MOOCs can, potentially, offer a realistic option for post-16 learners, for example in FE.

This paper is optimistic that analysis of course metrics, combined with insights into learner psychology, can be used to improve course design and achieve higher rates of completion. Learner analytics, according to the writers, show that improvements to course discussion forums in particular, the best predictor of completion, could boost drop-out rates. This study is statistical, it should be noted, and does not deploy any opinion sampling techniques.

Phil Hill writing in the blog e-literate²¹ has developed a similar 4-part typology of learners, with collaboration and critique from other specialists. It is not a one-to-one correspondence with the Stanford taxonomy, but clearly identifies the same issues.

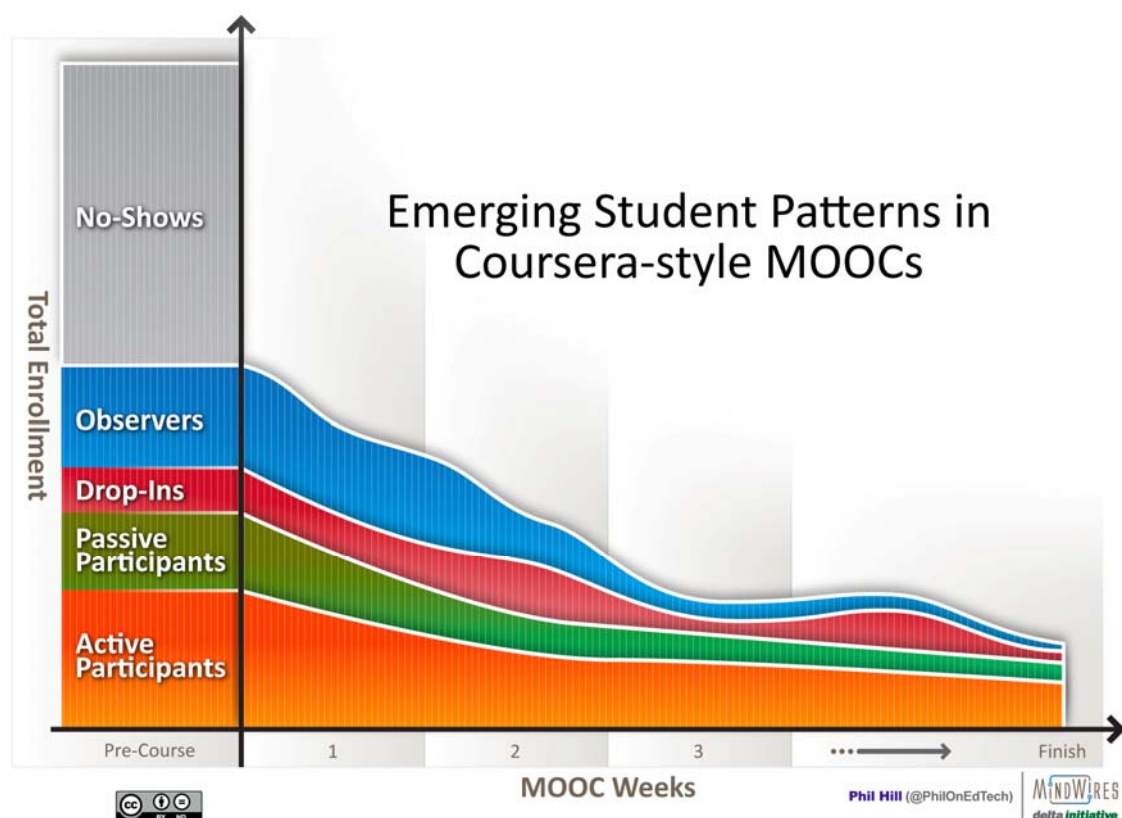
²⁰ at <http://lytics.stanford.edu/deconstructing-disengagement/>

²¹ http://mfeldstein.com/emerging_student_patterns_in_moocs_graphical_view/

- **Lurkers** –enrol but just observe or sample a few items at the most.
- **Drop-Ins** –partially or fully active participants for a select topic within the course, but do not attempt to complete the entire course.
- **Passive Participants** – students who view a course as content to consume and expect to be taught. Tend not to participate in activities or class discussions.
- **Active Participants** – students who fully participate in the MOOC, including consuming content, taking quizzes and exams, writing assignments and peer grading. Actively participate in discussions via discussion forums, blogs, twitter, Google+, or other forms of social media.

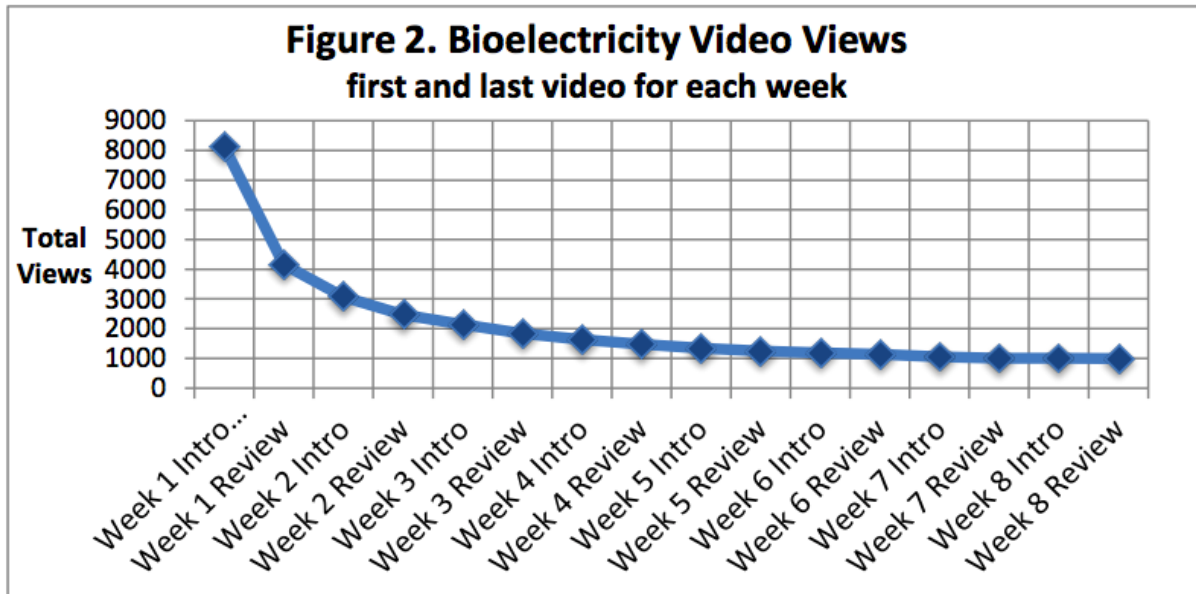
Hill has produced a widely-quoted chart (Fig 3) using this taxonomy, aggregating the available data, and shows a characteristic distribution of MOOC learner types across course duration in Coursera-style MOOCs (ie xMOOCs). This is a generalised graphic, with no numerical scales, but has been accepted and quoted by several commentators.

Fig 3: Patterns of student participation data in Coursera MOOCs



Hill provides a numerically based confirmation of the trend using numbers of video views reported in a Coursera MOOC on Bioelectricity (Fig 4).

Fig 4: Video Views in a Coursera MOOC



Stephen Downes, the Canadian online learning expert, MOOC practitioner and commentator, adopts the categorisation of participants proposed by Stanford. Downes argues that non-completion is a misleading metric, and more subtle classifications of learners are required.

Responding to several surveys of learner experience, Downes reflected in a Blog on a panel discussion of experts releasing results of various student surveys at ELI Online Spring Focus Session 2013, "Learning and the Massive Open Online Course," April 2013,

*"The majority of active users say they're taking the course for fun or a challenge, rather than a credential. The tendency to judge MOOCs based on completion rates overlooks the reasons why people join a MOOC. The majority engage in sampling behaviour [...] Many are MOOC auditors, but they don't engage, and they aren't motivated by completion records."*²²

Edinburgh University ran the first Coursera MOOCs in the UK and has devoted some effort to statistical analysis. With over 300,000 applicants for its first batch of six MOOCs, it had significant data to work with. The results are currently only published in an interim summary of the experience²³ with a second phase of analysis to follow later.

²² (reported by Michael Feldstein in e-literate <http://mfeldstein.com/insight-on-mooc-student-types-from-eli-focus-session/>)

²³<http://www.era.lib.ed.ac.uk/bitstream/1842/6683/1/Edinburgh%20MOOCs%20Report%202013%20%231.pdf>

Edinburgh surveyed 45,000 users on entry, and 15,000 on exit from its MOOCs . The data it obtained are subject to several caveats, and illustrated wide variation of trend within and between MOOCs.

The points which emerged clearly include:

- A very high proportion of window-shopping learners in all MOOCs
- 176 nationalities participated
- Dramatic declines in participation from enrollment to Week 1
- A very small proportion (3%) of completing learners felt they had not “got what they wanted” out of the courses – implying a high level of satisfaction
- Participation patterns after commencement varied widely between the six MOOCs
- Main reasons given for joining the courses were:
 - curiosity about MOOCs and online learning
 - desire to learn new subject matter.
- Career advancement and obtaining certificates were less important motivations
- MOOC learners in terms of their attitudes, skills and motivation are more akin to lifelong learning students in traditional universities than to students on degree programmes.

Two data tables from the Edinburgh learner survey are particularly worth quoting:

Fig 5: MOOC learner aspirations

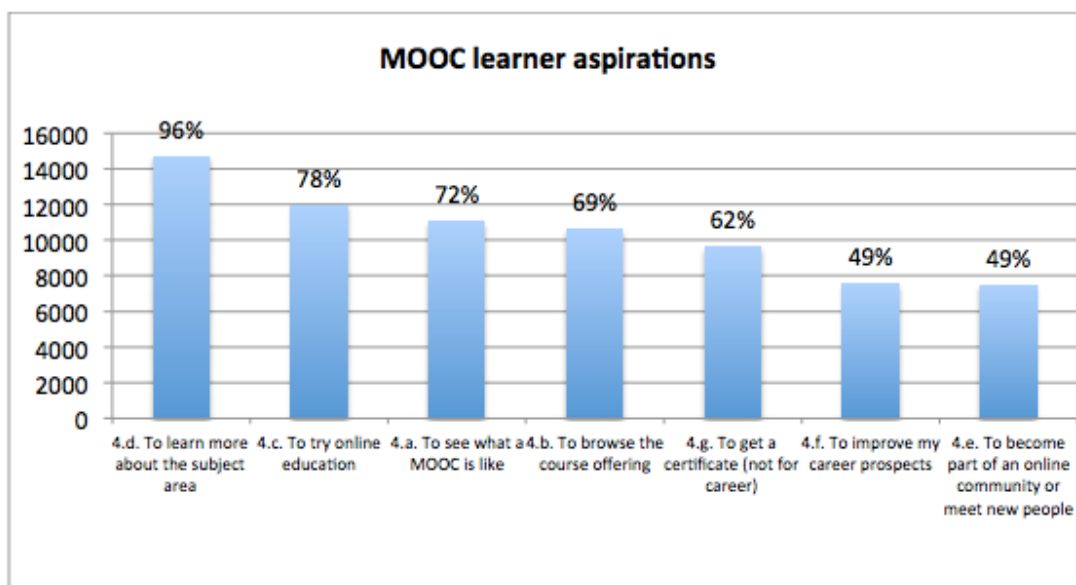


Figure 9 - Combined exit survey responses to Q4 'What did you hope to get out of the course and did it meet your expectations?' – calculated as a sum of *exceeded expectations*, *met expectations*, and *fell below expectations* responses – with percentage shown of total exit survey respondents

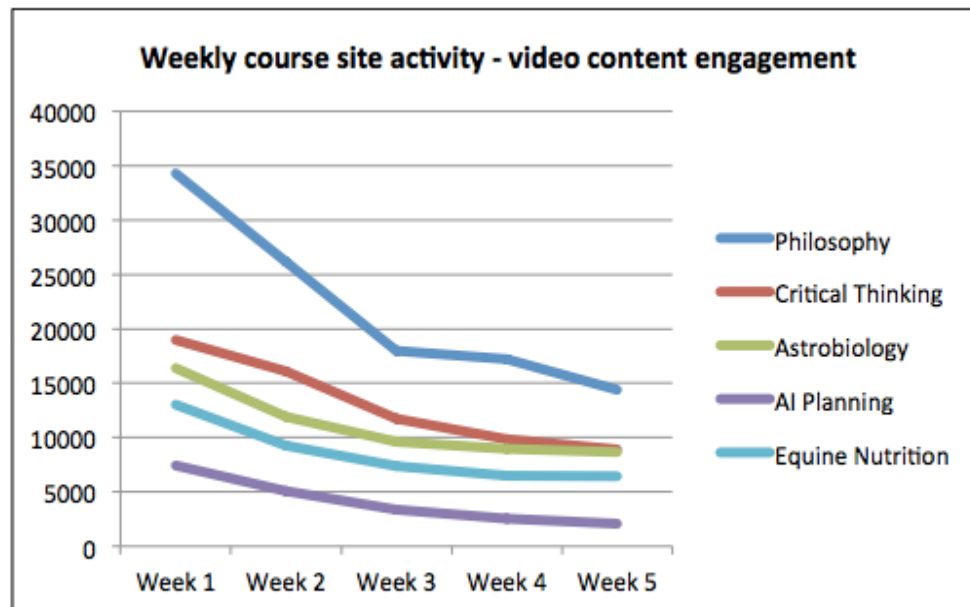
Fig 6: MOOC course activity record

Figure 7 - Week-by-week activity tracking of the number of unique course participants engaging with video content – viewed and downloaded combined results – during the first 5 weeks (applicable to 5 courses in total)

The picture emerges from Fig 5 (the responses of completing MOOC learners at exit for whom the course did not fail to meet expectations) that motivations were more exploratory than instrumental. This was a broadly curious audience, not motivated by any very specific goals, yet willing to commit significant effort if the content engages them.

In Fig 6 the Edinburgh data confirms the trend observed elsewhere, of clear declines in participation after the first two weeks of course units are served. However, the retention stabilises from Week 3 onwards.

Edinburgh clearly expects to continue its MOOC experiment, and its early thinking about future editions seems to revolve around handling the issue of large sign-ups but low course commencements, and maintaining the high quality of the MOOC experience for those who do actively participate. Among the large amount of data Edinburgh has published about its MOOCs, the most significant numbers for addressing the issue of learner engagement in the future are given below.

Fig 7: Conversion trends between enrolment and course participant activity

Course	Enrolments (04.02.13)	Active in first week	Conversion	Enrolment at peak (08.02.13)	Total active participants	Conversion
<i>Introduction to Philosophy</i>	96,717	41,528	43%	98,128	53,255	54%
<i>Critical Thinking</i>	74,006	26,320	36%	75,884	35,084	46%
<i>E-Learning & Digital Cultures</i>	42,091	16,250	39%	42,844	21,862	51%
<i>Astrobiology</i>	40,048	18,323	46%	39,556	20,413	52%
<i>AI Planning</i>	29,586	10,181	34%	29,894	15,546	52%
<i>Equine Nutrition</i>	22,605	15,100	65%	23,322	18,998	81%
Total	305,053	127,229	42%	309,628	165,158	53%

The Edinburgh data also shows engagement levels in different activities on the MOOCs.

Fig 8: Forum activity by course, with the average number of posts, comments, and votes cast by each active participant per activity

	Total no. participants (posting)	Average no. posts	Total no. participants (commenting)	Average no. comments	Total no. participants (voting)	Average no. votes
AI Planning	638	2.88	201	3.47	476	4.50
Astrobiology	3961	3.24	1861	4.79	3546	12.34
Critical Thinking	4783	2.32	1512	2.35	2728	4.16
E-learning	2623	3.41	1453	3.64	1763	5.24
Equine Nutrition	6031	3.11	1778	3.71	1761	6.17
Philosophy	7206	2.71	3265	5.24	5784	8.58

and the number of final assessments submitted for award of completion certificates.

Fig 9: Total number of course participant assessment submissions during Weeks 3, 5 and 7 of the MOOC

Course	No. of Week 3 assessments submitted	No. of Week 5 (or final) assessments submitted	No. of Week 7 assessments submitted
<i>Introduction to Philosophy</i>	13,928	11,439	9,937
<i>Critical Thinking</i>	5,301	7,286	
<i>E-Learning & Digital Cultures</i>	1,811	1,728	
<i>Astrobiology</i>	8,564	7,916	
<i>AI Planning</i>	739	743	
<i>Equine Nutrition</i>	9,513	8,897	
Total	39,856	38,009	9,937

The awarding of statements of accomplishment (SoA) is interesting not just for its indication of pass rates, but also for illustrating the wide range of outcomes between different courses.

Fig 10: Total number of SoAs distributed by each course and as a percentage of active learners

Course	Total SoAs awarded	% of active learners
<i>Introduction to Philosophy</i>	9,445	18%
<i>Critical Thinking</i>	6,909	20%
<i>E-Learning & Digital Cultures</i>	1,719	8%
<i>Astrobiology</i>	7,707	38%
<i>AI Planning</i>	654	4%
<i>Equine Nutrition</i>	8,416	44%
Total	34,850	21%

The full and final Edinburgh verdict on its MOOCs, based on complete analysis of course data, has not been published, but the first release of early data is the closest to a thorough analysis we have seen anywhere, and the most important set of statistical data so far about learner experience.

Primary Research interview: Hamish MacLeod, Edinburgh University

Additional primary research evidence for BIS was gathered in this review from a personal contact with the Course Chair of EDCMOOC (The title for Edinburgh's MOOC on digital technologies), who shared some additional data and thoughts on 24 April 2013 and in further phone/mail discussions.

In MacLeod's judgment, the Edinburgh MOOCs, although hosted on Coursera platforms which favour an instructivist learning model, were closer to the cMOOCs of the original constructivist school. Rather than provide the video-text-quiz format of most Coursera MOOCs the EDCMOOC pedagogy offered stimuli such as video and discussion in spaces such as Google's Hang-out. With over 60% of participants holding a post-graduate qualification, a constructivist approach, with no professorial inputs, was feasible.

Edinburgh bases the performance metric not on completion by enrollees (ie those who sign up) but on completion by those who start the first week of the course. Participation and completion figures for all the Edinburgh MOOCs therefore compare favourably with the headline completion rates (often in single figures) from other University xMOOCs on Coursera. Variation of rates between courses is also high, with applied science disciplines Equine Nutrition and Astrobiology securing over 40% completion rates. MacLeod attributes the Equine Nutrition popularity to the horsemeat scandal which erupted in the press as the course was launching.

The EDCMOOC on digital technologies produced a significant data base for MOOC researchers through its teachers' blog at <http://edcmoocteam.wordpress.com> and through its final course submissions – students were required to create a digital artefact. These can be read as reflections on MOOCs and demonstrations of students' outputs. Examples can be found at:

- <http://amysmooc.wordpress.com/2013/02/23/digital-life-an-augmented-music-video-parody-edcmooc-final-artifact/>
- <http://andydmitchell.blogspot.co.uk/2013/03/a.html>

The sense of a "Woodstock of online learning" (comment in an EDCMOOC Forum) suggests that Edinburgh's MOOC experience may have charted out a distinct space, possibly a British space, in the MOOC spectrum.

MacLeod observed that groups of between 15 and 30 pre-aggregated learners appeared to be going into the EDCMOOC, together with a supervisor/professor, and participating as a group according to their own prior agenda. MacLeod believes these may be students on courses from other institutions, or colleagues involved in shared professional development. He believes their work in MOOC was probably being assessed as part of a grading exercise. For MacLeod, this was a tantalising insight which suggests an important future development path for MOOC producers.

Tucker Balch, a computational trader (i.e., specialist in computerised financial trading) who happened to be a student on a course in computational trading run on Coursera in autumn 2012, enterprisingly obtained opinion data from 2,350 students on the MOOC and then presented results in a blog post “MOOC Student Demographics” at <http://augmentedtrader.wordpress.com/2013/01/27/mooc-student-demographics/>.

The demographic composition arguably reflects the course content as much as the MOOC format, but the tickbox opinion survey on completing learners is interesting. This was a MOOC with a 4.8% completion rate (of the signed-up students). Balch’s data relate almost entirely to those who completed. These responses show a clear majority of completers were satisfied with the instruction and materials, but less than half had satisfied their need for knowledge. There was a notable appetite for further learning on the topic:

Fig 11: Summary of selected opinion data from Coursera students

How much do you agree with each of these statements regarding your learning in the course?	
STATEMENT	Agree/strongly agree
Considering everything, the instructor was an effective teacher	61.1%
For the amount of time I invested in this course, I’m happy with what I learned	67.5%
The course materials were presented in an engaging manner	57.0%
I would like to take a more advanced course on this topic	92.2%
I found the course personally fulfilling	59.0%
I learned what I was hoping to learn in this course	42.8%

Satisfaction of students who did not complete the course:

Did you find the course useful even though you didn’t complete it?

Yes	89.7%
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The sample responding despite not completing the course is small (2.5%) and probably not as reliable as the completers, who are a large cohort. Nevertheless the satisfaction of nearly 90% of non-completers does suggest that non-completion cannot be taken as an indication of non-satisfaction.

Mackness, Mak and Williams, academic authors from three continents, presented *The Ideals and Reality of Participating in a MOOC*, a mixed-methods study of participants' experiences in the 2008 CCK08 module (an early MOOC entitled Connectivism and Connected Knowledge, run at the University of Manitoba). This was a seminal connectivist MOOC and the researchers' findings are heavily based on connectivism as a valid educational theory, as proposed by Downes and Siemens²⁴.

The main finding was that participants valued their autonomy in the MOOC, but did so at different levels depending upon language command, subject expertise, assessment for credit participants, personal learning styles and identity as well as the reputation of instructors and fellow participants.

Diversity was problematic for the participants, many of whom appeared not ready to become autonomous learners. The large number of participants also created a risk and fear for participants that conversations would degenerate into "noise". Openness, while representing sharing of resources and open communication, could also present issues of clarity as to course structure and expectations. The authors argue that these three problems impact on students' connectedness and interactivity.

The conclusion that despite the positive implementation of a connectivist pedagogy in the course, learners may have been compromised by lack of support and moderation, leads the authors to recommend light touch moderation to prevent confusion, firmly intervene in cases of negative behaviour, and explicitly communicate what forms unacceptable behaviour that can impede learning in the network. The lesson drawn for learners is that some constraints may actually improve the learning experience.

These observations from Mackness *et al* are, arguably, eclipsed by later events. MOOCs, xMOOCs in particular, have evolved in the direction of ever less scaffolding and support. Additionally, the impacts on learning of poor support and bad student behaviour were well known before the MOOC emerged.

Mackness returned to the theme and the CCK08 MOOC in 2010 in a second Lancaster University paper co-authored with Mak and Williams.

Another **Mak, Williams and Mackness (2010)** paper *Blogs and Forums as Learning Tools in a MOOC* further analysed learner attitudes to blogs and forums in the CCK08 MOOC²⁵. The authors compared how forums and blogs enabled learners to succeed with (1) personal connections with other participants; (2) conceptual connections with the ideas introduced in the course; (3) use of tools and learning affordances; (4) learning approaches.

²⁴ <http://www.lancs.ac.uk/fss/organisations/netlc/past/nlc2010/abstracts/PDFs/Mackness.pdf>

²⁵ <http://www.lancs.ac.uk/fss/organisations/netlc/past/nlc2010/abstracts/PDFs/Mak.pdf>

Mak *et al* found that a minority ceased participation due to unacceptable behaviour from fellow course participants. A new learning affordance was seen in the use of aggregated network blogs. However, a reduction in openness and autonomy was noticed due to a substantial preference for forums. The overall interpretation was that a steadily maturing set of social networking skills in the audience was enabling a new generation of learners ready to create their own learning affordances, and to develop their own learning practice.

Three dimensions were proposed by Mak *et al* for describing the attitudes of MOOC participants. They are:

- Home > < Bazaar - the dimension of presence, identity, autonomy and having a home base online.
- Long-loop > < Short-loop - the dimension pertaining to pace, crafted responses and type of sequence.
- “Engagement > < Reflection – the dimension ranging between use of blogs and forums as a way to connect with and “process” ideas.

The authors provide a wide range of learner comments and reactions to illustrate different learner positions along these spectra.

For example, in the home > < bazaar spectrum, one learner observation is:

I’m drawn to blogging. I can participate on my terms and in my context. I find blogs more valuable than forums due to the individual identity of blogs (as well as personal autonomy). The additional benefit of creating my own space for idea formation is the ability to search resources. I find I constantly search my blogs, delicious feeds, etc. Autonomy in participation is like autonomy in learning – i.e. personalization

, whereas another learner situates her experience along a dimension of engagement > < reflection in different terms:

Blogs are probably more self-reflective and meditative, but discussion in the forums was stimulating and led in many cases to great interactions that hardly seemed possible in a blog-and-comment form

Invoking evidence from their analysis, the writers argue that maturing competence in online social networking skills among the MOOC population is allowing learners to position themselves in multiple dimensions in the MOOC. Whereas on entry to a MOOC a learner might define themselves as simply a “blogger” or a “forum user”, the experience of the MOOC itself enabled them to use all the online tools in a more nuanced and expressive way.

Individual learner reports

Snapshot reports from learners about their experiences in MOOCs provide another form of literature to assess the learner experience. Such literature is necessarily personal and varied and partial. Here we review a sample of such literature, which ranges from a University President, to serial attendees, to casual drop-ins.

A University President who enrolled on, and completed, his own MOOC and was positive about it. *“It’s the differences among students, and how they bridge those differences through social networks, that energise their MOOC experience and mine”* (Michael Roth, President Wesleyan University, My Modern MOOC Experience, 29 April 2013 at http://chronicle.com/article/My-Modern-MOOC-Experience/138781/?cid=cr&utm_source=cr&utm_medium=en)

A Coursera MOOC participant reported favourably and in detail on their experiences at <http://fm.schmoller.net/2013/03/ian-chowcat-reviews-very-favourably-courseras-modern-and-contemporary-american-poetry.html> The student cites co-creation, forums and peer-assessment as all useful formats but says they greatest gain was from *“the vicarious learning involved in seeing students being guided to fumble their way towards sense-making”*.

Critical reports were collected from learners by *Digital Shift* blogger Audrey Watters at <http://www.thedigitalshift.com/2013/04/featured/got-mooc-massive-open-online-courses-are-poised-to-change-the-face-of-education/> . Watters, writing for the Library Journal, rounds up available data on students from various MOOCs, pointing out that they are not a representative sample of learners, and that data on students is collected patchily if at all, and usually released piecemeal by course teachers who have gathered it through surveys. The article covered high drop-out rates and attracted testimony about reasons for this from MOOC learners in comments. Evidence presented to Watters included the following:

“One reason I find for not completing a course is that certain graded assignments especially “the essay” are time consuming to complete using the very structured rules of the assignment. I spend more time making sure I follow these rules than I do researching and writing the essay. Since they are graded by other peers using a rubric, you dare not break the rules. I dislike writing about a contrived subject I have no interest in, especially because it is often thoroughly discussed in the lecture. The grading is more about whether you can write an essay and following the rules than what you get out of the assignment. It is designed so that the instructor has something to grade you on, not for its meaningfulness.”

(comment submitted 21 April 2013 at <http://www.thedigitalshift.com/2013/04/featured/got-mooc-massive-open-online-courses-are-poised-to-change-the-face-of-education/>)

On the other hand, another comment to Watters emphasised that failure was an inherent and valuable part of the MOOC experience.

“I have several college degrees and don’t really want any further “paper”, so I now use MOOCs in a very different way than described in the article. I enroll in courses in computer science that I am not at all adequately prepared to finish and sort of fail

up until I have no idea what is going on. I have learned many valuable skills this way.”

(Comment submitted 19 April 2013 at <http://www.thedigitalshift.com/2013/04/featured/got-mooc-massive-open-online-courses-are-poised-to-change-the-face-of-education/>)

Analysing the experience of learners on “Nand to Tetris”, a MOOC-like course, MOOC enthusiast Simon Shocken identifies the “hacker mentality” as the essential ingredient for the successful students: they like to work in groups to figure stuff out. This is his precondition for student success in MOOCs: Participants motivated by passion, not the quest for grades.

Harvard’s appeal in March 2013 to its alumni to enter and engage in a Harvard MOOC was reported in New York Times²⁶ as evidence of a poor learner experience and low quality class interactions. The free, pilot Greek history module Concepts of the Ancient Greek Hero taught by Professor Gregory Nagy was popular with students online, but the University apparently noticed that discussions were “off the rails” or were of a low, unacceptable quality. The decision to recruit alumni in order to have “*enough people monitoring, asking pointed questions, [and] highlighting smart comments*” was aimed to complement the course’s teaching efforts and bring the module up to standard.

Edinburgh University’s tracking of its MOOC learners also elicited useful anecdotal learner reports. These have not yet been fully analysed and published, but preliminary paraphrases are available, for example in THES²⁷ whose article published student comments such as:

- the numbers of people engaged with the course’s discussion boards made the experience rather overwhelming
- the feeling of being part of a huge movement - like a club, attending a concert or a demo - a sense of belonging.

²⁶ http://www.nytimes.com/2013/03/26/education/harvard-asks-alumni-to-donate-time-to-free-online-course.html?_r=2&

²⁷ <http://www.timeshighereducation.co.uk/news/how-was-it-the-uks-first-mooc-assessed/2003218.article>

Sub-conclusion: Informed critiques on MOOCs

The overview literature contributed by informed writers covers the MOOC phenomenon from two distinct perspectives: their impact on education institutions, and their impact on learners.

Whether the MOOC is a welcome or a threatening prospect for HEIs divides informed writers. However, there is consensus that MOOCs do offer education institutions a lever for transition. On balance, the literature expresses the view that MOOCs will probably not threaten traditional forms of University teaching in the short term, but a significant sub-group of credible writers foresees wide and sudden changes and disruptions to HEIs from MOOCs.

Learners' experiences in MOOCs are examined in literature, both through statistical analysis and anecdote. Writers assess MOOCs as challenging environments which can discourage or disorient many learners, as witnessed by the low percentages completing. However, the literature also shows that mere completion is not a relevant metric, that learners participate in many valid ways, and that those who do complete MOOCs have high levels of satisfaction. There is as yet no agreed satisfactory system of measurement for assessing the quality of MOOCs from the learners' point of view.

Formal objective analysis of MOOCs commissioned by Authorities

Formal objective and comprehensive reports and analyses on MOOCs have been commissioned by Research Centres, Governments, Education Ministries, Consultancies and other organisations concerned to establish independent objective data. Some of these are also actors in the online education business.

The reviews considered for BIS are as follows:

Fig 12: 'In a sentence' summaries of Authority-commissioned MOOC reports

Report	In a sentence: MOOCs....
EIU	... mean learners will take control, a victory for democracy
Sloan Consortium 2012	...are interesting, but most people won't rush into them
Austrade: <i>More than MOOCs</i>	... will disrupt international demand for national education product
Canada's SSRC (The McAuley Report/<i>The MOOC Model</i>)	... can transform the national digital economy, but may exclude many learners
JISC-CETIS: <i>Implications for HE</i>	... are just the next step in online learning technology
IPPR/Pearson: <i>An Avalanche is Coming</i>	... are already disrupting and transforming HE: stand by for mayhem !

Report	In a sentence: MOOCs....
Education Advisory Board	... are forcing Universities to use new pedagogies
UniversitiesUK: <i>The MOOC Moment</i>	... may help HE reform, but think hard before producing one.
Survey of Provosts	...Opinion of Provosts is that MOOCs threaten HE institutions and aren't what Universities need most
Gallup Survey of US College Presidents	... Opinion of Presidents is that MOOCs might help to improve pedagogy and reputation, but not much else

The formal studies in general provide a more nuanced, detailed and sceptical view of the potential of MOOCs than the informed overview articles reviewed above. While the impetus MOOCs bring of innovation is acknowledged and welcomed, on balance these formal reports sound cautionary notes and are less likely than other types of literature to be positive about the impact of MOOCs.

However, such studies are not necessarily infallible. HEFCE commissioned a report on the UK ODL landscape in 2010 from TALL (Technology-Assisted Lifelong Learning) at the Department for Continuing Education University of Oxford²⁸. The MOOC revolution was already underway at this point, but TALL's report entirely missed it. Portraying a world in which open distance learning was almost exclusively oriented to postgraduate business curricula, the TALL authors identified the barriers to the expansion of ODL as discoverability ("*ODL courses on the web [...] are often "hidden" in complex institutional websites*") and a lack of market intelligence holding back ODL providers from expansion.

MOOCs have eliminated both of these barriers in a mere three years – and invalidated TALL's methodological formal analysis based on a fairly thorough survey of literature and institutions.

²⁸ <http://www.jisc.ac.uk/media/documents/projects/UKOnlineLearningStudy-FinalReport-Mar10-FINAL-FORPUB.pdf>

Economist Intelligence Unit

[http://www.managementthinking.eiu.com/sites/default/files/downloads/Article%203%20-](http://www.managementthinking.eiu.com/sites/default/files/downloads/Article%203%20-%20Education_Humans%20&%20machines.pdf?elq=0d5d8046ac2e4ca2b8c0da629ae064fe&elqCampaignId=873)

An analysis published by the Economist Intelligence Unit in March 2013 at The Economist's "Technology Frontiers Summit" emphasised the potential for a revolution in education. Thanks to technologisation of learning in general, and to MOOCs in particular, a previously conservative and change-resistant education sector is being subjected to a welcome democratisation. "*As technology takes centre stage, the power of learners to control their own learning increases*". While acknowledging cautious voices, The Economist perspective is broadly positive, speaking of enrichment as a consequence of change. "*Despite inevitable tensions, all signs point to the various forms of teacher-technology-student interaction becoming enriched rather than diminished.*"²⁹

Sloan Consortium

The Sloan Consortium publishes a Survey of Online Learning annually, referring to US data only³⁰.

The 2012 Survey of US Academic leaders suggested that while the number of students taking at least one online course and the consideration for online learning continue to grow, adoption of Massive Open Online Courses remained low, with most institutions still on the sidelines.

"Institutional opinions on MOOCs are mixed, with positive views of their ability to learn about online pedagogy and to attract new students, but concerns about whether they represent a sustainable method for offering courses."

2.6 percent of US higher education institutions currently had a MOOC while 9.4 percent report MOOCs were in the planning stages (Fig 10). On the other hand, the Sloan Consortium report does show a steady rise in the role of online learning for HEIs (Fig 12). This refers to formal online courses but may, in time, create a foundation for wider enthusiasm for MOOCs as a specific online format.

²⁹http://www.managementthinking.eiu.com/sites/default/files/downloads/Article%203%20-%20Education_Humans%20&%20machines.pdf?elq=0d5d8046ac2e4ca2b8c0da629ae064fe&elqCampaignId=873

³⁰ http://sloanconsortium.org/publications/survey/changing_course_2012

Figure 13: MOOC plans of US Academic Leaders 2012

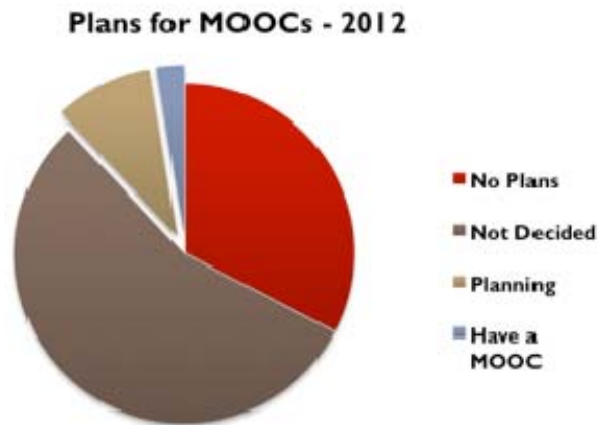
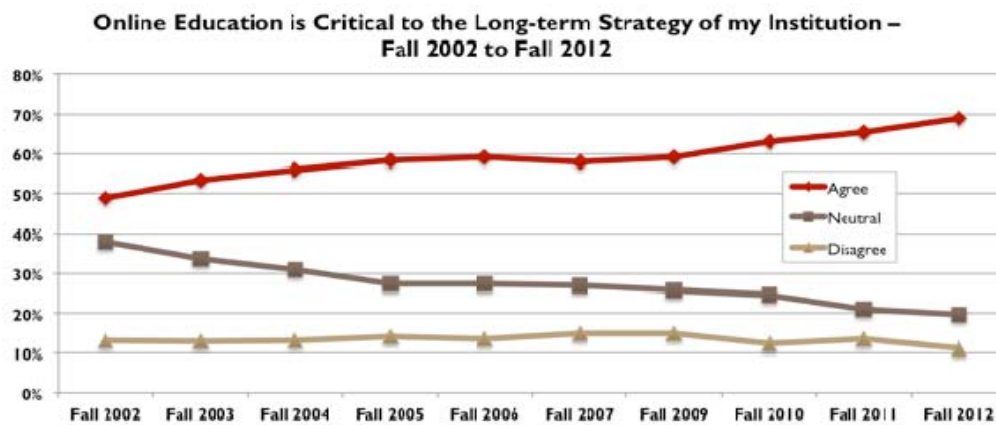


Fig 14: Views of Academic Leaders about the role of online query-learning in their HEI



Austrade

Austrade, Australia's equivalent of UKTI, commissioned a formal review of the MOOC issue in 2012, *More than MOOCs: Opportunities arising from disruptive technologies in education*. The report is not publicly available, but has been consistently praised by commentators who have seen it.

Austrade assessed MOOCs in the context of the policy of maintaining the global attractiveness of Australian Higher Education. The majority of the report is concerned with narrating and analysing US developments, and its conclusions in this respect are not different to many others reviewed elsewhere. MOOCs can help to reform pedagogy, expand markets, prepare students, develop educational research and so on.

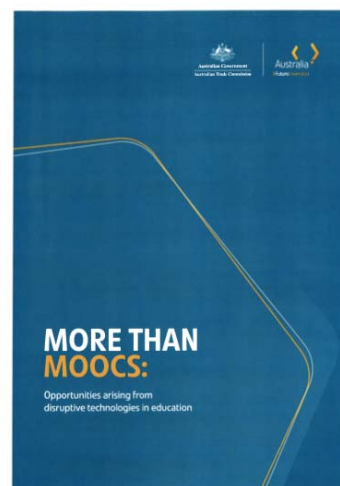
The insights into opportunity and challenge arising from MOOCs are the Austrade's significant addition to the literature. These include:

- Targeting new segments of the student market
- Using MOOCs as a student marketing tool
- Education R & D
- Better learning experiences
- Access for Australian learning product to the US market
- Responding to the challenge of non-Education players.

The opportunities for Australian Higher Education in the wake of MOOCs are mostly seen in the context of ability to play upon and join in with trends emerging from America.

The single largest policy challenge identified by Austrade's writers is the disruption in the future demand for Australian education. Australia's core export and international market, SE Asia, is already making decisive steps in online education and MOOC experimentation, the report observes. The sense of crisis gripping America's online educational environment is not yet present in Australian institutions, raising a risk of complacency.

Australian academic commentators on Austrade's *More than MOOCs* report included blogger "The Common Room" (Stephen Matchett) who took issue with the report's view that *"middle or lower tier institutions may find it difficult to compete with free or low cost options delivered by higher quality institutions unless they have a clear value proposition aligned to specific segments of the market"*.³¹



31

http://blogs.theaustralian.news.com.au/thecommonroom/index.php/theaustralian/comments/more_than_one_way_to_move_a_mooc

Matchett disagrees, and argues an optimistic perspective, that MOOCs are a lifeline for universities such as Australia's which aim to play globally but are not in the world's top 8.

“There is plenty of room for universities to use technology to compete in a global village. [...] Universities can get into the medium size MOOCs business. The usual arguments adapted from manufacturing to explain how we can't compete do not apply. Distance and a small domestic market are irrelevant, it is the quality of courses and the way they are delivered that matter. Australia has huge comparative advantages in these fields – an English speaking academic workforce and a strong academic reputation. Just as students will travel to study here, so they will buy the brand on-line, especially if Australian online courses are cost competitive.”

Canada – SSHRC “The MOOC model”

Canada's SSHRC (Social Sciences and Humanities Research Council) – an equivalent of the UK's ESRC - assigned funds to University of Prince Edward Island to commission a thoughtful and expert team of leading Canadian experts (McAuley, Steward, Siemens, Cormier) to produce a seminal early study on the implications of MOOCs for the digital economy in 2010 in the paper *The MOOC model for digital practice*.³² Canada's digital economy is the report's reference point, and the type of MOOC considered is the cMOOC, but the analysis is valid across all the advanced economies and MOOC types. Although the entry of the xMOOC platforms and commercial players has dramatically altered the landscape, and have added a corporate business dimension to economic issues, this report's insight into issues around pedagogy and student experience remains valid.

This document is sometimes referred to as “*The McAuley report*”.

Video summaries of the MOOC Model report are available as follows:

- What is a MOOC: <http://edactive.ca/mooc/whatisamooc>
- New users: <http://edactive.ca/mooc/successinamooc>
- Creation of knowledge: <http://edactive.ca/mooc/knowledgeinamooc>
- MOOCs and the digital economy: <http://edactive.ca/mooc/digitaleconomysample>

The report uses the purist definition of a MOOC, typical of the early 2010 period when these courses were an experimental extension of the connectivist school of online learning. McAuley *et al* state that MOOCs combine:

³² McAuley, A., Stewart, B., Siemens, G., & Cormier, D. (2010). *The MOOC model for digital practice*. Retrieved from http://www.elearnspace.org/Articles/MOOC_Final.pdf

“the connectivity of social networking, the facilitation of an acknowledged expert in a field of study, and a collection of freely accessible online resources. Perhaps most importantly, however, a MOOC builds on the active engagement of several hundred to several thousand “students” who self-organize their participation according to learning goals, prior knowledge and skills, and common interests. Although it may share in some of the conventions of an ordinary course, such as a predefined timeline and weekly topics for consideration, a MOOC generally carries no fees, no prerequisites other than Internet access and interest, no predefined expectations for participation, and no formal accreditation.”

Three years later, reflecting the pace of change in the field, this definition would require changing on three counts:

1. fees are being levied for some aspects of MOOCs
2. awarding of certificates is already prevalent, and accreditation looks likely to be quite widely adopted
3. the definition of MOOCs is itself contested.

The McAuley report identifies the main issues facing MOOCs as pedagogical, viz:

- The extent to which it can support deep enquiry and the creation of sophisticated knowledge
- The breadth versus the depth of participation
- Whether and under what conditions successful participation can extend beyond those with broadband access and sophisticated social networking skills
- Identifying the processes and practices that might encourage lurkers, or “legitimate peripheral participants”, to take on more active and central roles
- The impact or value of even peripheral participation, specifically the extent to which it might contribute to participation in the digital economy in extra-MOOC practices
- Specific strategies to maximise the effective contribution of facilitators in particular and more advanced participants in general
- The role for accreditation, if any, and how it might be implemented.

There are many valuable insights from the McAuley report. We here extract and paraphrase/quote a selection that seem particularly resonant and central to continuing debate. This thematic organisation is for this report, and not McAuley’s.

MOOCs and Networks

- a. Understanding how social interactions scale in networks is critical to understanding the future of education

- b. MOOCs model and build capacity for collaborative networks of unprecedented size that transcend time and space
- c. Network ties created between people during a MOOC have the potential to continue as sustainable and relevant personal and professional connections beyond the boundaries of the course itself.

MOOCs and the learning sector

- d. MOOCs exist in a cultural space contested by business interests, the standardised-skills lobby, and social media
- e. MOOCs innovate the process of knowledge-making. They are a departure from the traditional brick and mortar Universities and from the “walled gardens” of conventional learning management systems, insofar as they share the processes of knowledge work, not just the products. Facilitators share their sense making habits and their thinking processes with participants
- f. MOOCs challenge traditional notions of the ways in which value is created in the education system. They announce a digital economic model which has to harness the capacity of its citizens to connect, innovate and reconfigure the known into new knowledge. With MOOCs, financial investment in education shifts from creating content, to fostering, guiding and interacting within the learning process
- g. MOOCs are a first generation testing ground for knowledge growth in a distributed, global, digital world. They reduce barriers to learning and increase the autonomy of learners and foster the development of citizens’ confidence to engage and create collaboratively. As such they are important for Canada's future as a leader in the digital economy.

Learner goals and experiences

- h. Within the MOOC environment that completion of all course assignments is neither necessary nor the goal of every student
- i. As MOOCs begin to command the interest of policy-makers and business, questions of accreditation (*overlooked by the initial enthusiastic networkers*) will come to the fore
- j. A basic premise of a MOOC is shared responsibility among students for setting direction, but some learners find this experience confusing, in relation to expectations of a course model environment
- k. While a traditional course provides many points of scaffolding that allow for an otherwise safe place for a participant to experiment, a MOOC strips away these scaffolds. Learning in MOOCs requires basic digital literacies and topics within the “comfort zone” of the learners
- l. Students who come to a MOOC course without the discourse of the reputational economy, or who come without the literacies to develop and sustain a network, may take far less out of a MOOC experience
- m. Information literacy is privileged and rewarded specifically in MOOCs. In a MOOC age, foundation skills will include social network management, blogging, and

comprehending the etiquette of linking as a sourcing technique; downloading and installing software (like Audacity, Jing); creating podcasts, editing, uploading files; creating and sharing video; creating and sharing mindmaps/concept maps; and posting discussions into forums like Moodle

- n. Concepts of gender and class determine students' MOOC experiences. Consistently taking open, declarative positions, cross-examining and critiquing the work of others, and challenging authority and received wisdom are all critical to full participation in a MOOC, yet are discourses heavily identified with privilege.

There are, however, some insights from the McAuley report that have been disproven since 2010. One was the prediction that MOOCs' *"lack of accreditation or external rubber stamp may also limit participation, both in terms of people perceiving the course as less worthy or demanding of time commitment"*. Interestingly, this has not proven a barrier to growth; rather, as a barrier to monetisation it is being contested by MOOC producers rather than participants.

JISC-CETIS

The white paper *MOOCs and Open Education: Implications for Higher Education* by Yuan and Powell for JISC CETIS³³ is a perspective from within the community of University educational technology. These authors carefully place MOOCs within a wider context of open education (open access and scalability), online learning and the changes in higher education at a time of globalisation and constrained budgets. MOOCs, they also argue, relate directly to current debates about course provision, funding and demands for improved access to higher education.

Yuan and Powell's description of the MOOC landscape, along with other writers, distinguishes cMOOCs (connectivist, cognitive approach) vs. xMOOCs (prescriptive, behaviourist). It lists the main MOOC players not just as edX, Coursera, Udacity, Udemy, but also includes P2Pu and Khan Academy as pioneering efforts. MOOCs are also seen as vehicles for corporations such as Pearson and Google to pursue their ambitions in private higher education provision.

The JISC-CETIS report characterises MOOCs as a work in progress. They show potential in increasing higher education participation, knowledge exchange and collaboration. However, they have not answered concerns about learner motivation, course completion, sustainability, business model and assessment/certification. The authors also note that networked learning is a daunting and complex activity, and this means MOOCs risk becoming a preserve of the tech-savvy.

MOOCs may be, Yuan and Powell suggest, an example of disruptive innovation (Bower and Christensen term). As such, they may dislodge the traditional, residential form of



³³ <http://publications.cetis.ac.uk/wp-content/uploads/2013/03/MOOCs-and-Open-Education.pdf>

delivery in higher education by unbundling it. The pervasiveness of online technology, volatile funding models, globalisation and the perception of commercial opportunity are all accelerating the disruptive innovation. MOOCs represent an iteration in open education in which globalised for-profit providers will offer differentiated instruction and lowered costs.

IPPR/Pearson: an Avalanche is coming

The IPPR-published report *An avalanche is coming: Higher education and the revolution ahead*³⁴ prophesies a threatening storm of change for universities around the world as their traditional roles and functions are unbundled and transformed. In what the authors characterise as a dangerous moment of passage, the MOOC is a major actor.



This report was written by Pearson, a major and not disinterested player in online education, and moreover specifically involved in MOOCs as a provider of proctoring (ie verified examination) services to Coursera and other MOOC platforms. Pearson is also a prospective publisher and distributor of content through MOOCs. It has reasons, therefore, to acclaim them.

In the words of Pearson’s Michael Barber, prefacing the report,

“Massive Open Online Courses (MOOCs) can take the best instructors global. Choosing among these resources and combining them as appropriate, many of those served by traditional universities may be able to better serve their objectives.”

Using a definition of MOOCs as courses which “are free of charge, open to a global audience and built for large numbers of people”, the IPPR/Pearson report identifies the significant difference between MOOCs and prior forms of online learning as “*this shift from depending on the government to focusing on the customer – in this case the student – [which] has played out again and again in other sectors as globalisation and technology have changed the rules of the game.*”

Attention in this report is also given to the full range of actors and developments with disruptive potential, not just MOOCs. These include:

- Degreed.com, which tracks accomplishment of MOOC courses and projects and issues online certificates

³⁴ An avalanche is coming: Higher education and the revolution ahead [Michael Barber, Katelyn Donnelly, Saad Rizvi](http://www.ippr.org/publication/55/10432/an-avalanche-is-coming-higher-education-and-the-revolution-ahead) IPPR: 11 Mar 2013 <http://www.ippr.org/publication/55/10432/an-avalanche-is-coming-higher-education-and-the-revolution-ahead>

- Issuing of badges by Mozilla as demonstrations of skill and worth (Mozilla's open badges initiative allows web denizens to gain online "badges" of competency awarded by peers and community)
- LinkedIn's crowd functions for endorsing skills and projects and giving references.

In the context of a broken business model for traditional university teaching, facing rising costs and competition on the one hand, and falling application numbers at many colleges on the other, the MOOC and other challengers herald a perfect storm. Rewards will be reaped by those who exploit destructive innovation cleverly:

"The potential unbundling is a certainly a threat, but those who rebundle well will find they have reinvented higher education for the 21st century."

The IPPR/Pearson report systematically analyses all the areas of Higher Education activity which are threatened by the avalanche. The authors see a role for MOOCs in forcing the pace of change in nearly all of these areas. The Curriculum, for example, *"is increasingly becoming a commodity. MOOCs have opened up access to tried and tested curricula for anyone in the world to use. This is especially pertinent for the more basic courses that define a large part of the undergraduate experience."*

Citing the vice-chancellor at the University of Western Australia, the IPPR/Pearson report locates the source of pressure for MOOCs in a combination of student choice and business rationale:

"MOOC is a real issue. No responsible university today would let faculty members spend time writing a 'purpose built' textbook for their individual units, given books are already widely and cheaply available. It will get hard to justify letting them work up the lecture content for traditional delivery of Econ 101 or Calculus 101 when it's also available online for free, there are only so many ways the material can be taught, and students are already voting with their feet (attendance at some lectures in the Business School is often below 50% by about week 3 of classes)."

Assessing the extent to which existing education formats, including traditional online learning, can survive, this report identifies their best chances in platforms which provide aggregated solutions for programme design. Examples are given as 2U and eCollege, which allow a University to deliver identified curricula using online learning tools. Britain's LearnRev, a specialist provider of specific skills training in online form, may also offer a way for conventional learning to retain market. MOOCs will take their place alongside such business process simplifiers as a tool to reduce costs and pass the savings along to the student in the form of reduced fees.

Following this diagnosis of critical illness, the suggested treatment for traditional universities is MOOC-centric. A survival plan for Universities:

"might involve customising MOOC curricula according to local context, needs and languages. A professor in China, for example, might use the Economics 101 course on EdX to develop a version in Chinese using local case studies. Universities could focus their energies on developing curricula that function in a niche space not

addressed by MOOCs. Also, while the MOOC can provide content, it cannot check easily whether students are developing the wider attributes that will ensure success in the 21st century labour market or society – a good professor can. This customisation and localisation are likely to be vital parts of the salvation of universities that are not a part of the elite.”

In the face of this alarmist analysis, the IPPR/Pearson report notes that “*few universities in the US have chosen to be [...] bold, and the same is true globally. In the face of an oncoming avalanche though, adopting a bold and urgent strategy would seem to be advisable. [...] One strategy doomed to failure, however, is the choice to wait and see and hope that perhaps the avalanche is not coming after all.*”

Five possible emerging models for HE are suggested by IPPR/Pearson, which may enable institutions to survive the meltdown. They are:

1. The elite university, with a global brand, a strong endowment, a stellar track record and a stock of famous alumni
2. The mass university offering a good education for global middle class, predominantly online or blended, and processing hundreds of thousands of students at a time
3. The Niche University. Nice town, pretty campus, good teaching, special focus etc.
4. The Local University. Regional workforce training
5. The Lifelong Learning Mechanism. Universities provide professional and vocational learning for exploratory or instrumental learners.

Higher Education Ministries’ responsibilities in the face of the avalanche are described as:

- Supervising a diminishing role for the state as a funder of Higher Education
- Support for talented students in crucial areas such as STEM
- Supporting equity of access
- Advanced research in fields crucial to the country’s economy
- Incentivising or catalysing changes that the market, left to itself, would not bring about fast enough
- Reviewing frameworks for student fees and support.

Two more open-ended insights about the impact of MOOCs from the IPPR/Pearson report, which nevertheless come to rest in policymakers’ inbox, are:

- Internationalisation. How to create frameworks for assessing degrees from online universities based in another country, or a course from a MOOC. Does a government have an interest in supporting its own universities as opposed to those elsewhere? If so, how is this different from offering subsidies that in other sectors of the economy would clash with World Trade Organisation (WTO) rules?

- Students' learning skills. Students in the future, to survive in the MOOC-shaped educational landscape, will need to be self-motivated, innovative active agents prepared to take responsibility for their own learning and skill development.

Reactions to IPPR/Pearson

Not all reports engender responses which are significant in their own right, but reactions to the IPPR/Pearson report have been numerous and strong. The comment on the IPPR site includes many writers who have attacked its apocalyptic diagnosis. As an example, education blogger Seb Schmoller [responded](#) that “*what is really going on is better viewed as a rather slower “tectonic” movement, that peppers the landscape with very big but patchy bursts of change*”, and that the history of prophecies of doom such as the IPPR’s paper, was that they tended to be overstated.

Arguably, the IPPR/Pearson team, in hailing the role of MOOCs as unbundlers, has possibly overstated the case. The unbundling process is equally driven by entities such as StraighterLine, a commercial education undertaking in the USA, which has stripped out the job of learner management and mentoring, and conducts it on behalf of colleges. IPPR/Pearson analysis is also, arguably, not reflecting the ambitions of many educational professionals (and their institutions) to provide full services. The withdrawal of Duke University from an unbundling project to pool online resources signals a possible source of resistance to these trends.

University Leadership Council Education Advisory Board

The Education Advisory Board, a US non-profit organisation, commissioned *Understanding the MOOC Trend: The Adoption and Impact of Massive Open Online Courses*³⁵. This a zippy overview of the MOOC phenomenon in 2012. Containing many useful visualisations, the report is a comprehensive topic primer which presents issues from the perspective of College senior management.

The Education Advisory Board reports that for a small elite 1% of top institutions, MOOCs offer improved positions through adoption of new technology, public interest and wider access. But, warns the Advisory Board; for the remaining 99% of Universities and Colleges, MOOCs contain dangers.

“The threat is that students will choose free MOOCs instead of paying tuition, weakening an already fiercely competitive market for students. The key question is whether MOOCs will be seen as a substitute or a complement to face-to-face classes. Potentially the greatest threat is to increasingly important revenues from continuing and professional education courses (many delivered completely or partly online).”

³⁵ The EAB site at <http://www.eab.com/Research-and-Insights/Academic-Affairs-Forum/Studies/2012/Understanding-the-MOOC-Trend> is the official way to access this document, but it is restricted circulation. Oregon State has helpfully put it up at <http://blogs.oregonstate.edu/engage/files/2012/12/Understanding-the-MOOC-Trend.pdf>

However, the single bright hope for the mass of colleges, including Community Colleges, is that MOOCs will bring free access to high quality learning materials.

The Education Advisory Board identifies two main impacts of MOOCs:

Biggest Short-Term Impact: Legitimisation of Online and Hybrid Learning

- Online and hybrid courses will move from the periphery to the centre of attention in higher education. The distinction between online and face-to-face will dissolve.

Biggest Long-Term Impact: Developing a Science of Pedagogy

- Faculty is redesigning courses based on learning outcomes data. Adaptive learning assessment and competency demonstration will replace traditional syllabi. Better documented outcomes and more fluid transfer of credits across institutions will result.

UniversitiesUK

UniversitiesUK commissioned its report *Massive Open Online Courses – Higher Education’s Digital Moment*³⁶ to summarise MOOC developments and discuss MOOC issues for the UK University community in May 2013. This report situates MOOC issues within a larger set of issues for Universities about how they take up digital and online opportunities.

This report starts from the position that many MOOC issues remain unanswered but that MOOCs nevertheless merit serious attention from UK universities because they bring the potential for significant disruption, and they are a spearhead for a wider move to greater adoption of online learning modes in HE.

The three top points about MOOCs, for the UK University establishment, are given as:

1. They are a legitimate and indeed strategic element of the University offer, capable of informing and improving processes of entry, award, credit transfer
2. They can drive recruitment, not only of home students but also of globalised learners and vocational learners, by exploiting their flexibility, low cost and pedagogical benefits
3. They can support the restructuring of HE, both by enabling cost reduction and business model innovation, and also by bringing new network-centred skills and competencies to pedagogy and to curricula.

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³⁶<http://www.universitiesuk.ac.uk/highereducation/Documents/2013/MassiveOpenOnlineCourses.pdf>

UK Universities, therefore, need to evaluate their strategies and develop responses. The agenda for reflection and response is presented under the headings of Sustainability, Pedagogy, Credit and Capacity.

In addition to its rehearsal of MOOC history development, the UniversitiesUK report highlights the trends which capture its diagnosis of MOOCs as the “digital moment” for UK HE. These include:

- a) Increasing emphasis in professional development as a MOOC application. The use of vocational content, badges, validation and the involvement of recruitment services as sponsors testify to this
 - b) Segmenting of courses by ability – such as Udacity’s tiered system and the entry-level courses conducted by Community Colleges
 - c) A growing trend for students to exchange reviews and judgments about courses, leading to rapid circulation of opinion about design and materials, and responses from course organisers
 - d) A blurring of the boundaries between different kinds of MOOC (the xMOOC and cMOOC distinction is “breaking down” and MOOCs are increasingly run alongside campus traditional courses
 - e) Increasing focus on formal recognition of MOOC learning as a priority for policy makers and institutions. Methods for accrediting such learning will include badges and adoption of validation techniques such as keyboard tracking and honour codes. The lack of any systematic credit recognition policy in any UK MOOC is noted.
1. **Supporting educational missions.** Taking as a model the way news publishers have supported their titles through online versions, the report cites evidence that open educational resources drive up paid course enrolments by around 10%. Market leaders are particularly well placed to attract new students from a strong free web presence. Expanding a University’s footprint in the digital space is less risky, less costly and faster than doing so in the real world.
 2. **Driving Internationalisation.** Noting that international participation in MOOCs is much higher than other forms of HE, Universities UK recommends MOOCs both as a lower cost alternative to some Trans National Education (TNE) arrangements, and as a way of delivering preparation and induction to students prior to embarking on TNE arrangements.
 3. **Diversified learning pathways.** MOOCs offer a new and flexible pathway in learning. To take advantage, faculties are urged to join MOOCs experimentally, along with their students; and to audit the IP of their content with a view to clearing copyright for MOOC publication in due course.
 4. **Cost restructuring.** Citing again the experience of news publishers, whose cost model has been re-invented by the internet, UniversitiesUK advises that the free

MOOC model of online learning will impact the tuition-based revenue model. This will happen in four domains: Content production, building of delivery platforms, provision of feedback and support, and awards. In all these dimensions, MOOCs offer not just new financial models, but in addition the opportunity to unbundle elements of the HE package and deliver them through different channels.

5. **Shared Services.** Universities are also advised to embrace the possibilities of sharing content and student support services that come with aggregation platforms. The University of California move to provide a single statewide version of core courses shared by multiple institutions is offered as an example.

6. **Learning R&D.** UniversitiesUK underlines that MOOCs foster a set of so-called “emergent learning technologies” (as opposed to those already resident in installed Learning Management Systems) and highlights the potential from them. The priority technologies are listed as:
 - Learning Analytics (to improve feedback to students)
 - Adaptive Learning (personalised pathways)
 - Social Network Analysis (puts connection and linkage to the fore)
 - Discourse Analytics (automated assessment)
 - Semantic Web Technologies (automated personalised enabling of customised support and content feeds)
 - Virtual Problem Based Learning (immersive environments to hone procedural skills).

The report makes the observation, based on the experience of Amazon and Google, that early adoption of such technologies can help to build dominant market positions, and applies this principle to Universities.

(By way of commentary on this list, the present authors note that UniversitiesUK have not identified the authentication technologies (Iris recognition, key stroke pattern) that would automate learning validation – we consider this an omission, especially as Coursera is already deploying some of them.)

7. **Reforming the Core.** Under this rubric, UniversitiesUK considers a basket of institution-wide issues raised by the increasing role of online provision in University offers. Recommending that Universities rebalance “different aspects of an institution’s work, including online and physical, free and paid-for provision”, the report lists several areas of HE activity which may need to be reassessed including quality assessment, assurance and organisational structure. Included in this heading is the need to deliver courses that give students the skills to extract value from online environments – including new presentation and networking skillsets. Academics and administrators too will need re-educated, to exploit data and technology opportunities more effectively as part of their workload.

Overall, the UniversitiesUK report takes a more cautious than enthusiastic view of MOOCs. There is no outright endorsement for the format. Rather, the report authors affirm that MOOCs remain peripheral to many Universities' agendas, offer no leverage on their more pressing problems, and may drain resources. Recognition and pedagogical quality remain doubtful. The final note is on the "significant challenge" of responding, in terms of resources and institutional restructuring.

At its most positive, UniversitiesUK acknowledges that "MOOCs may yet come to represent a valuable addition to the higher education landscape in their own right". The report believes the future of MOOCs may lie in their appeal to part-time, professional and international learners (ie outside the traditional campus student core). In contrast to the conclusion of US reports, and the IPPR/Pearson report, that immediate action is essential, UniversitiesUK advocates a process of critical reflection and experimentation, even at the expense of "a different (ie slower) trajectory of change".

Nevertheless, and despite its caveats and caution, the UniversitiesUK message is that MOOCs bring opportunity and that, correctly embraced, they will enable institutions "to advance education missions, drive student recruitment and internationalization, and develop new pathways into higher education".

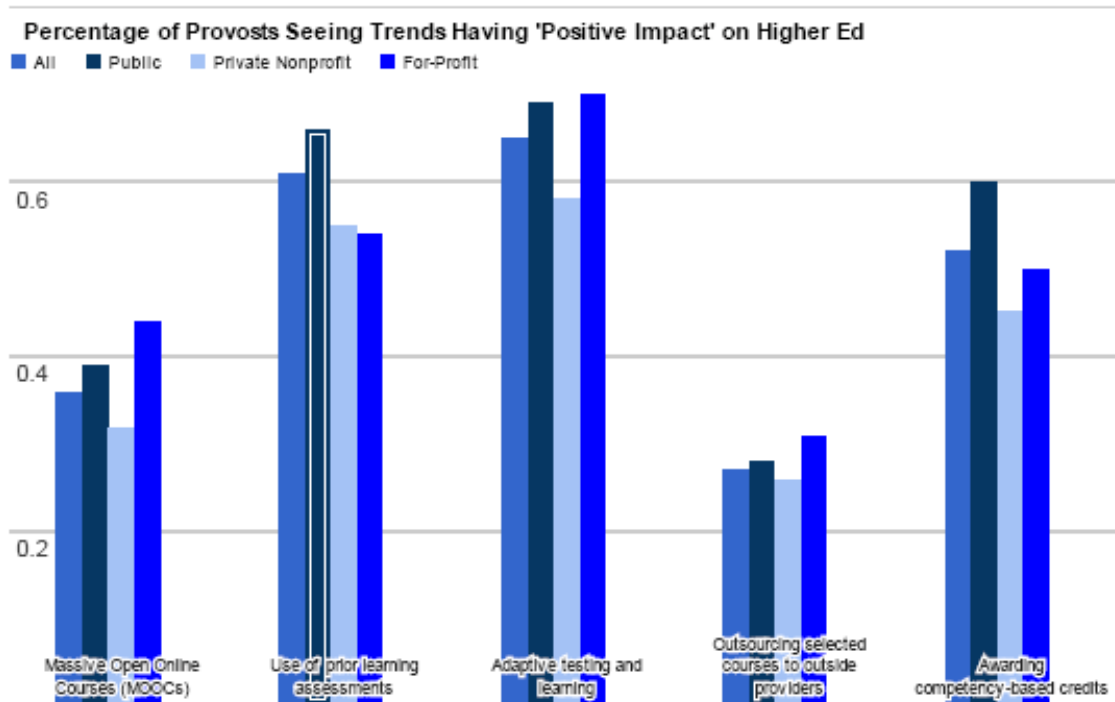
Survey of Provosts

The 2013 *Inside Higher Ed* Survey of College and University Chief Academic Officers³⁷ found that relatively few Provosts see MOOCs playing a positive, transformational role in higher education.

Most provosts surveyed believed that other types of reform initiatives -- such as prior learning assessment or competency-based learning -- will have a positive impact on higher education.

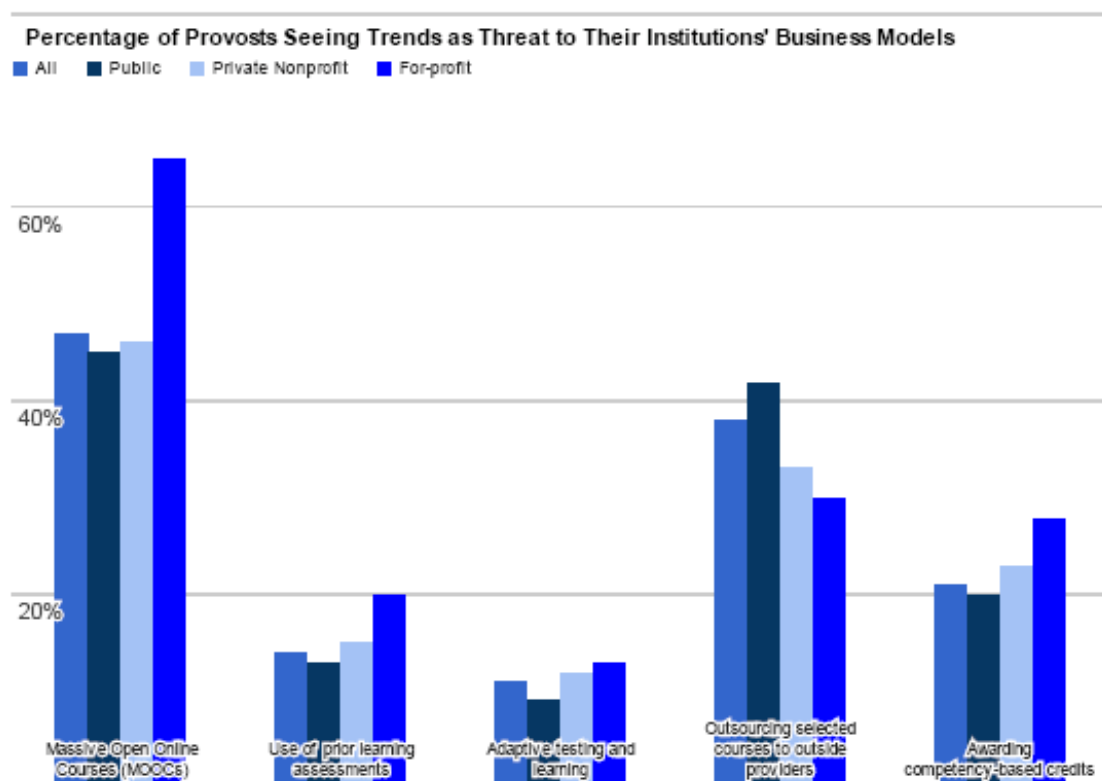
³⁷ <http://www.insidehighered.com/news/survey/skepticism-about-tenure-moocs-and-presidency-survey-provosts>

Figure 13: Survey of positively impacting trends in Higher Education



Half of provosts believed that MOOCs could threaten "the business model of my institution." The highest level of concern is in for-profit higher education, where 65 percent of provosts believe that to be the case.

Figure 14: Trends perceived as threats to Higher Education business models



Gallup Survey of US College Presidents

Gallup launched an opinion survey of US College Presidents in May 2013 which asked about MOOCs. The 889 surveyed Presidents reported scepticism about most aspects of MOOCs³⁸.

Fig 15: Results from Gallup survey of US College Presidents

<i>I consider MOOCs to be a solution to the following:</i>	1	2	3	4	5	Don't Know
Scale from 1 (strongly disagree) to 5 (strongly agree)						
Improve the learning of all students	28%	31%	24%	10%	3%	4%
Solving colleges' financial challenges	31%	33%	21%	9%	2%	4%
Getting superior teachers in front of more students	18%	22%	28%	22%	7%	3%
Fostering creative pedagogical strategies	10%	17%	27%	32%	11%	3%
Increasing collaboration among colleges	10%	19%	30%	29%	7%	5%
Reducing costs of education to students	15%	23%	31%	20%	8%	4%

Over half of Presidents felt MOOCs offered no solution to the challenges of finance and learning quality. The most positive answers were around pedagogical creativity with 43% believing MOOCs offer solutions.

Inside Higher Ed publishes “The MOOC moment”

The volume of MOOC content in specialist online Higher Education title InsideHigherEd has led to a printable aggregation called “*The MOOC Moment*” of all MOOC-related content from this publisher³⁹. While not aiming to be a systematic overview, it is nevertheless a comprehensive blow-by-blow aggregation of significant content. The booklet contains both news articles and opinion essays.

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³⁸ <http://www.insidehighered.com/news/2013/05/02/survey-finds-presidents-are-skeptical-moocs>

³⁹ <http://www.insidehighered.com/content/editorial-booklets>

Sub-conclusion: Formal analysis of MOOCs commissioned by authorities

The disruptive and potentially threatening nature of MOOCs emerges consistently from almost every formal analytical report. With the exception of Canada's early "MOOC Model" report written in the optimistic moment of the first cMOOCs, authorities who commission or produce systematic MOOC analyses come up with a similar conclusion: **MOOC formats will pose huge challenges for existing HEI business models, for institutions at all levels, for pedagogy, and for international educational demand.**

Analyses vary in the amount of positive energisation they discern alongside these disruptive elements of MOOCs. At their most benign, MOOCs will drive innovation and experimentation, leading to improved learning and lower costs and a managed restructuring. At their most ferocious, MOOCs will force many HE players to radically transform themselves, or die, and a chaotic rout of the sector is in prospect.

Challenges for learners also emerge as a consistent thread of analysis. There will be benefits in terms of flexible pathways and accessible affordable learning. However, the literacies and skills required to benefit from MOOCs are very specific. Existing educational curricula may be unsuited. Equity in access may be an issue.

Journalistic and press writing about MOOCs

The level of general press attention to MOOCs, from 2012 onwards, means that mass media literature, while not always offering the most detailed or analytical content, is an essential part of a literature assessment. The feast of general coverage creates facts of opinion on the ground, and expectations, to which MOOC providers have to respond.

The positive coverage of MOOCs in influential US press titles has contributed to a conflict about MOOCs within Universities, according to reports from US College Presidents made off the record to Scott Jashcik, a journalist at Inside Higher Ed. A MOOC-sceptical academic body, often fully aware of a good e-learning tradition within their institutions, confronts a governing body which is MOOC-enthusiastic because “publications read all the time by trustees (*The Wall Street Journal* and *The New York Times*, for example) have published many articles and columns extolling MOOCs”.⁴⁰

We present a selection of prominent general media articles balanced for geography, source, tone and format. Editorial angles most frequently taken include themes of democratisation (anyone can do it), no cost, the emergence of cheap education, high drop-out rates, the participation of venture-capital backed companies, the presence of top-rank Universities, and tales of young students from Developing World countries achieving high levels of attainment.

Positive Spin

- *The Economist* in its Christmas 2012 issue reported MOOCs in a similar vein to the New York Times, as the phenomenon of the year, under headlines such as “Free Education” and “Learning New Lessons”. MOOCs are a Darwinian selector mechanism that drive a valuable process of reform in which the best will be “transformed” while laggards will face “bankruptcy”⁴¹.
- *Huffington Post* carried an article in 2012 entitled *What Are MOOCs and Why Are Education Leaders Interested in Them?*⁴², in which author Josh Jarrett (who is Senior Programme Officer for Post-secondary Success, Bill & Melinda Gates Foundation) hails MOOCs as “affordable, personalised learning for all” and applauds the efforts of private foundations behind sustaining MOOCs. He cites the \$3 million in grants made by his employer The Bill & Melinda Gates Foundation to MIT in developing edX collaborations with community colleges. Jarrett states the benefits of MOOCs as (1) lowering the cost of higher education; (2) revolutionising

⁴⁰ <http://www.insidehighered.com/news/2013/05/02/survey-finds-presidents-are-skeptical-moocs>

⁴¹ <http://www.economist.com/news/international/21568738-online-courses-are-transforming-higher-education-creating-new-opportunities-best>

⁴² http://www.huffingtonpost.com/impatient-optimists/what-are-moocs-and-why-ar_b_2123399.html

pedagogy by personalising learning; and (3) widening higher education participation.

- Writing in *Nature* in March 2013, Mitchell Waldrop the Features Editor reviews MOOCs and characterises them as a financial and organisation lifeline for Universities, allowing “expanding the reach of existing campuses while streamlining the workload for educators” at a time of financial pressure. Waldrop argues that while the Silicon-valley inspired MOOC platforms have successfully demonstrated that “there is no added value from watching lectures in a lecture hall rather than on an i-pad, they have yet to prove that they can replicate the value of face to face conversations in Higher Education.”⁴³
- The techno-utopian magazine *Wired* has extolled MOOCs with the claim that they “could change Higher Learning for ever”⁴⁴ and when charges of hype emerged, *Wired* commissioned opinion pieces from MOOC enthusiasts, such as Clayton Christensen, who acclaims MOOCs as a “groundbreaking [...] transformation” akin to Henry Ford’s creation of popular motoring.⁴⁵
- Nathan Harden, in a 2013 article in the free-market and right-wing publication *American Interest* magazine, entitled apocalyptically *The End of the University as We Know It*⁴⁶, provides a perspective that is pessimistic for universities while optimistic about MOOCs. He argues that a “college bubble” has rendered the traditional education format unviable. Factors responsible are: (1) spiralling costs of university education and the debt it entails for average students; (2) “credential inflation” that leads to an increasing demand for graduate schooling and consequently more debt; and (3) the ever-increasing rate for default for college loans.

Harden predicts that the traditional university will be supplanted by virtual formats offering higher education at a much lower cost. He predicts the withering away of small, low-level institutions to vocational training institutes while big, elite universities battle it out for survival, with nimble and innovative institutions standing to gain. Harden hails MOOCs developed by Harvard and MIT (EdX) as well as Stanford (Coursera) as the agency of change. He cites their scalability and the higher productivity of online learning as the reasons MOOCs will thrive, and he claims that problems with credentialing are already being addressed by devices such as “certificates of mastery”.

Harden predicts the rise of third-party providers to regulate the distribution of higher education programmes, and new business opportunities. He foresees competitive forces driving elite universities to come up with responsive MOOCs whilst lower-status universities and community colleges may opt to “downstream” the former’s content to their students. He also foresees increasing flexibility in attaining higher

⁴³ <http://www.nature.com/news/online-learning-campus-2-0-1.12590>

⁴⁴ http://www.wired.com/wiredscience/2012/03/ff_aiclass/

⁴⁵ <http://www.wired.com/opinion/2013/02/beyond-the-mooc-buzz-where-are-they-going-really/>

⁴⁶ <http://the-american-interest.com/article.cfm?piece=1352>

education, with employers assessing candidates based on courses taken in MOOCs and other virtual education platforms.

Sceptical spin

Writers in the general daily press have more recently started to comment on a possible “bubble” phenomenon around MOOCs, and critical commentary in the general press, as of spring 2013, is beginning to become more commonplace.

- The *Financial Times* Education editor Michael Skapinker detects a Gartner hype cycle⁴⁷. (Skapinker, Michael (March 20, 2013). "[Open web courses are massively overhyped](#)". *Financial Times*)
- *The Guardian* has published critical op-ed pieces including a claim that “The promise of MOOCs to improve access and democratize knowledge is a chimera” (Vernon, M (April 30, 2013, *Open online courses – an avalanche that might just get stopped*) <http://www.guardian.co.uk/education/2013/apr/29/massive-open-online-courses>)
- The techno-anarchist title *TechCrunch* has focused on the opposition and friction around MOOCs, reporting for example the doubts of professors about credit for MOOCs, and the rejection of the California State University pilot for low cost purely online courses for lower-division degrees.⁴⁸
- In *The Atlantic* in 2012, journalist Robinson Meyer reported on *What It's Like to Teach a MOOC (and What the Heck's a MOOC?)*⁴⁹, framing MOOCs in terms of free classes with elite universities who are taking the lead by offering their courses to thousands of students online. (ie cMOOCs have ceased to be worth a mention). Meyer acknowledges MOOCs as a game changer in higher education, but notes the dearth of evidence from educators about the experience of teaching one, and sets out to describe the teaching experience, based on evidence from Amanda French of George Mason University and responses to it at an educators' conference.

Meyer's account of MOOCs is more critical than most. He assesses the benefits of MOOC format for faculty as (1) delivering specialised content online; (2) programming autograders to mark student work; (3) facilitating continuing professional learning, especially for IT workers. He assesses the downsides from a teaching perspective as (1) roughly equal student course performance, ie no better learning from MOOCs; (2) the low passing rates (7% for the particular MOOC he observes); (3) unacceptable behaviour of a minority of students; (4) a “cheating-rich” environment; and (5) the difficulty of creating MOOCs for liberal arts and humanities because of their inquiry-based pedagogy.

⁴⁷ <http://www.ft.com/cms/s/2/84f6cd3e-8a50-11e2-bf79-00144feabdc0.html#axzz2PcHimOzr>

⁴⁸ <http://techcrunch.com/2013/03/22/72-of-professors-who-teach-online-courses-dont-think-their-students-deserve-credit/>

⁴⁹ <http://www.theatlantic.com/technology/archive/2012/07/what-its-like-to-teach-a-mooc-and-what-the-hecks-a-mooc/260000/>

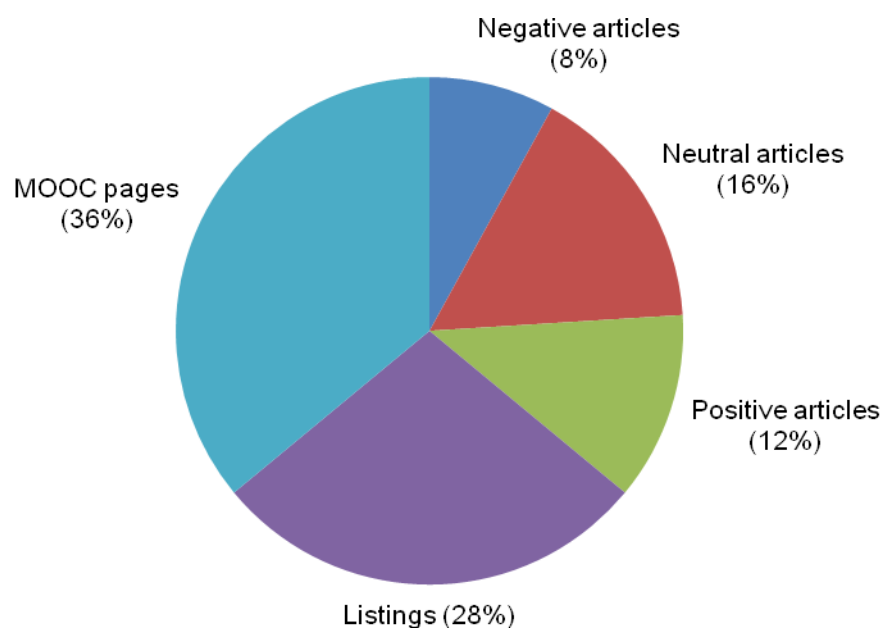
Meyer concludes that, for educators, the MOOC concept has doubtful validity. They are to be welcomed, not so much for any educational benefits, but for their capacity to generate debate about teaching in general.

MOOC Press sentiment tracker

To capture the distribution of general content on MOOC, we have performed a simple mechanical analysis of the first 50 items returned for the Google search query MOOC on 25 April and then again on 29 May. We have rated them for tone. This table is embedded in our document and can be accessed by right-clicking the chart.

The extent to which the search engine algorithm is indexing pages of MOOCs and MOOC listings suggests the producers of these pages are producing SEO (Search Engine Optimised) content. The proportion of negatively scored articles is low at 8%.

Figure 16: MOOC Google search result index – top 50 (25/4/13) (online readers: to see data right click the pie chart & select “edit data”)



When performing this exercise a month later, we were able to observe a difference. The proportion of search results delivering aggregator pages and MOOC courses was rising significantly. So was the proportion of negative-scored news articles, rising to 12%. This is only a snapshot and cannot be taken as a sign of a trend. However, it does suggest that sentiment tracking around the MOOC phenomenon could be undertaken.

Sub-conclusion: Journalistic and press writing about MOOCs

Popular discourse in mainstream media titles is a relevant fact in the MOOC trajectory, creating a bubble of attention and a “must have” factor, which may be contributing to a herd mentality in education.

Positively-spun articles hail MOOCs as the hi-tech engine of a transformative revolution that will remake education as a highly engaging, open and low cost activity.

Critical journalism decries the hype surrounding MOOCs and claims that their benefits are illusory, and that in reality MOOCs harbour undesirable and inappropriate behaviours, and are instruments of educational and social exclusion.

Although hard numerical evidence of the balance between these two opposing “spins” is hard to come by, anecdote, observation, and a count of search returns suggests that the proportion of negative commentary may be rising.

Infographic overviews

Education press titles and educational specialist websites have contributed overviews in the form of infographics. Readers are strongly advised to locate these graphics online using the links.

- Education Chronicle drew the key personalities and organisations in the MOOC universe http://chronicle.com/article/Major-Players-in-the-MOOC/138817/?cid=wc&utm_source=wc&utm_medium=en
- Open Creative Communications, a consultancy, published an infographic based on its work in the education sector, <http://blog.opencc.co.uk/2012/11/2012-the-year-of-the-mooc-the-evolution-of-elearning-infographic/>
- EdTechTimes offered a simple What's a MOOC <http://edtechtimes.com/wp-content/uploads/2012/12/whatsamooc.jpeg>
- A CCK11 student satirised the MOOC and the infographic trend with a cartoon version of a MOOC <http://gbl55.files.wordpress.com/2011/03/mooc3.png?w=700>. This kind of irreverent and satirical representation is an established genre of MOOC commentary, and is often contributed by MOOC learners in the course of their MOOC study. (Edinburgh University has displayed several of them). The best known are arguably the mock horror film posters satirising EdX MOOCs as a sci-fi creature set to devour innocent victims.

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Fig 18: MOOC infographic from Education Chronicle

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Fig 19: MOOC infographic from EdTech Times

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Fig 20: MOOC infographic from Open Creative Communications

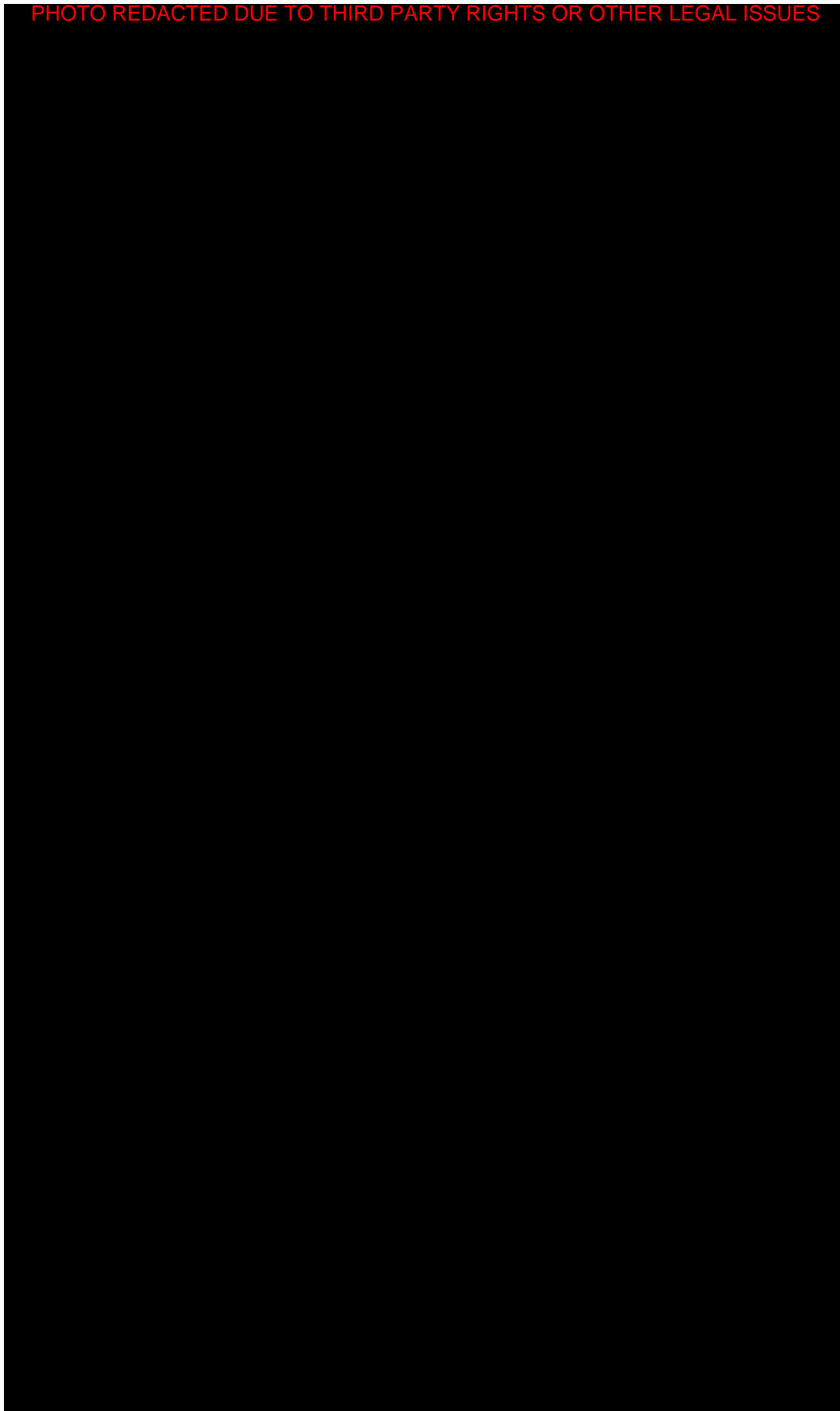
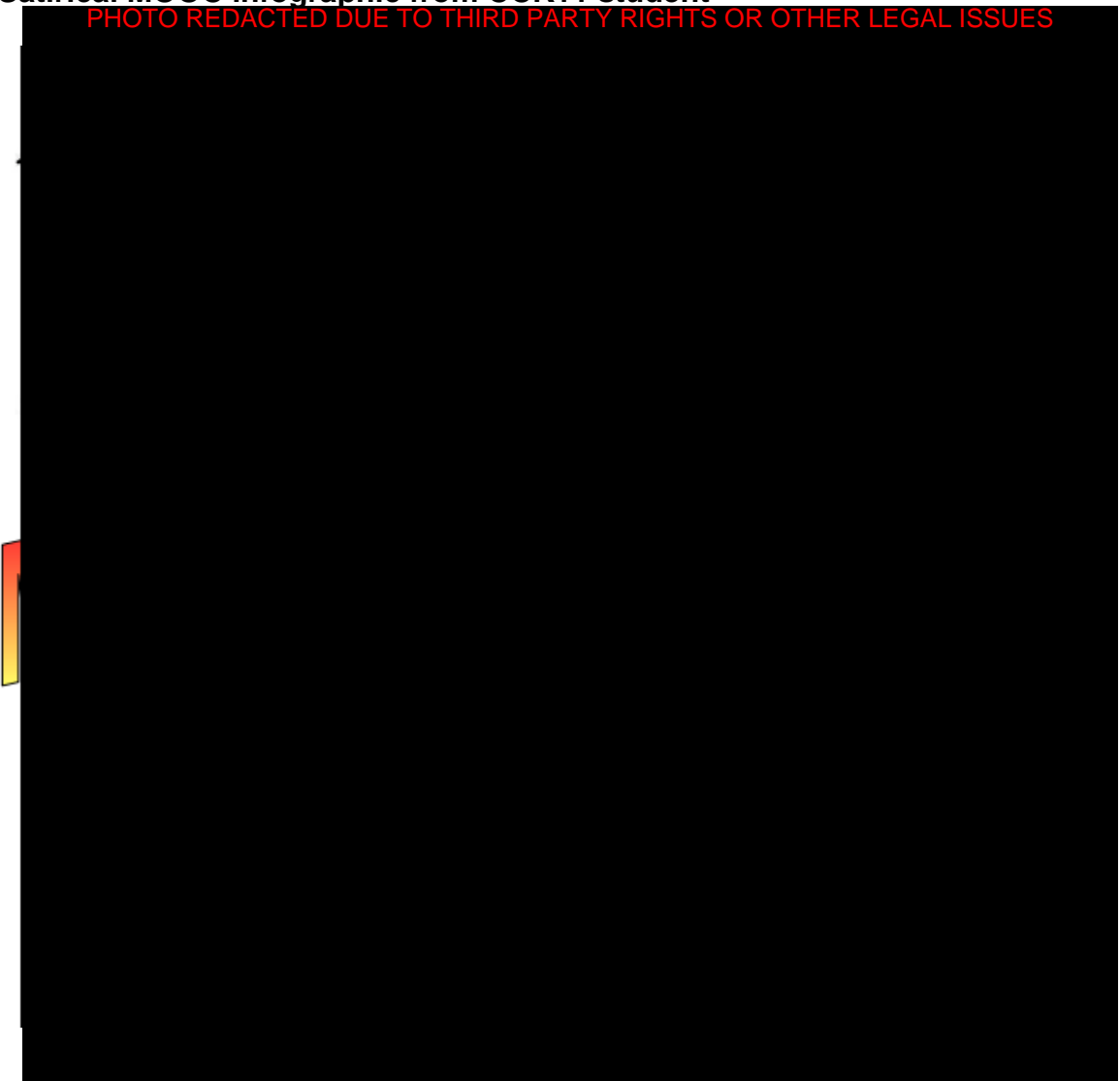


Fig 21: Satirical MOOC infographic from CCK11 student



Part Two: Issues

Business and financial models

MOOCs – by almost every interpretation – are set to impact the business, financial and commercial operations of Higher Education. This is a consensual theme that emerges clearly from all the current literature. It should be noted that, up to now, this impact is more widely forecast than observed in practice. However, institutional developments are beginning to reflect the maturing MOOC phenomenon. This is seen most widely in the following areas.

1. Cost-reducing financial models for course production and sale
2. Emergence of viable sources of revenue for MOOC operators
3. Growing acceptance for accreditation of MOOC learning
4. Extension of MOOC format beyond elite institutions via:
 - a. Open access by other institutions to quality content hosted in MOOC platforms
 - b. Recruitment of second-tier Universities to MOOC platforms.

Course production cost - falling

Literature has explored the cost advantages of MOOCs over other forms of online course production.

The resource requirement of creating online courses is identified by Walter Sinnott-Armstrong of Duke University in an advice video widely used as a guide to course making⁵⁰.

Sinnott-Armstrong outlines a 10 step process for developing general online courses which involves intensive teacher effort to develop a syllabus, explicitly identify the topics covered and plan the time required to cover them. Inputs include detailed scripting, set-up of audiovisual equipment and hardware, recording, editing and enhancement. Permissions, quizzes, uploads, monitoring and in-course modification also add to the teacher workload.

MOOC teams also report intensive workloads (Edinburgh staff reported round the clock working for several weeks). However, the technique of leveraging the cohort to develop its own syllabus, media, assessment and modifications, eliminates many of the steps of course preparation that might otherwise fall on tutors.

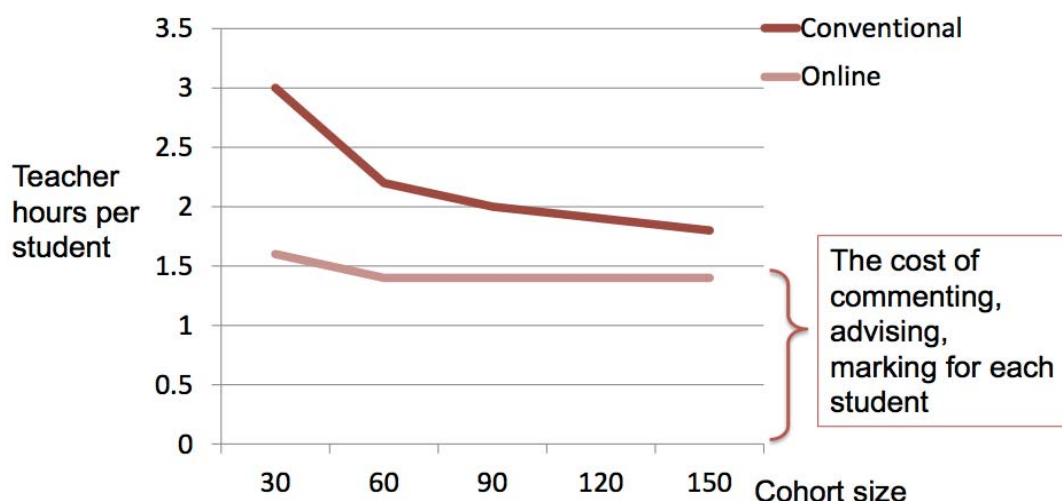
⁵⁰ <http://www.youtube.com/watch?v=JKbPNx2TSgM>

The comparable MOOC presentation *Developing, designing and running MOOCs* by George Siemens (2012)⁵¹ describes the workload in planning and running MOOCs. For Siemens, this is a 9 step-process: (1) developing a topic for a certain audience, (2) finding other facilitators preferably from other backgrounds, (3) determining course content (blogs, online articles, lecture videos) as a starting point for the course, (4) planning spaces for interaction (tags, forums, blogs, emails etc.), (5) planning interactions (synchronous v asynchronous), (6) planning the continued presence of facilitators through active participation, (7) organising learning creation through course activities and peer feedback, (8) promoting and sharing the course site, and (9) iterating and improving on previous course work.

Research by the Chronicle of Higher Ed⁵² established that a recent Chronicle survey found that professors typically spent 100 hours to develop a MOOC, and then eight to 10 hours each week while the courses were in session. This commitment amounted to a drain on their normal campus responsibilities.

The cost advantage of MOOCs over other educational forms is explored by Diana Laurillard, a former OU Vice-Chancellor and now a Director at the Institute of Education London Knowledge Lab. In a presentation in February 2013⁵³ at the conference “Online and open-access learning in higher education: MOOCs, new pedagogies and business models”, Laurillard showed that neither online nor F2F conventional teaching structures can use scale to improve upon the optimum 1:25 staff:student ratio. However, argued Laurillard, pedagogical innovations do have the potential to achieve cost breakthroughs.

Fig 21: Model of the costs of increased student cohort size in conventional and MOOC education (source: Laurillard op cit)



⁵¹ <http://www.slideshare.net/gsiemens/designing-and-running-a-mooc>

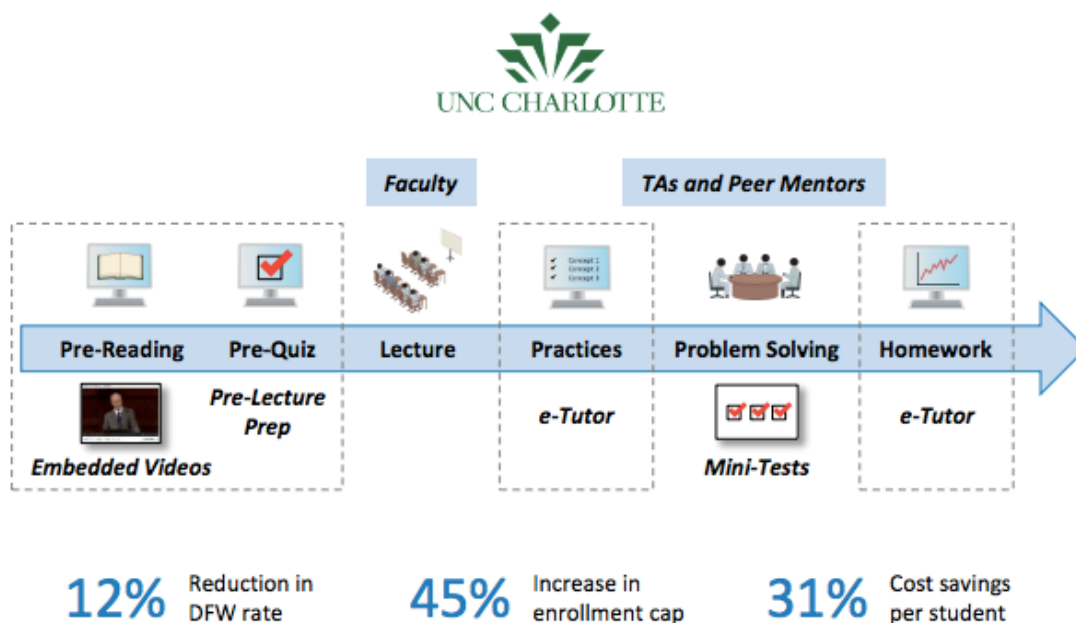
⁵² <http://chronicle.com/article/The-Professors-Behind-the-MOOC/137905/#id=overview>

⁵³ <http://www.lfhe.ac.uk/en/research-resources/post-event-resources/conferences-and-events/Onlineandopenaccess/index.cfm>

In the paper *A constructionist learning environment for teachers to model learning designs* (2012) Laurillard *et al* scope out the reduction in learning time and course design time that could come from applying improved instructional design techniques. The paper suggests teacher preparation time can be more than halved⁵⁴.

The Centre for Teaching and Learning research at the University of North Carolina at Charlotte has similar findings based on cost analysis of MOOC type course construction models, identifying a 12% reduction in the Drop/Fail/Withdraw rate (DFW) and a final 31% cost saving per student⁵⁵.

Fig 23: Cost-reduction metrics from UNC Charlotte



The different workloads (in quantity, quality and scheduling flexibility) are an important dimension in the financial and business case for MOOCs over conventional online course production.

Revenue sources - starting to emerge

Revenue models are emerging slowly and piecemeal in the literature. They are being pieced together from snippets of information and leaked documents, rather than being formally presented.

⁵⁴ <http://change.mooc.ca/files/dl/Laurillard%20et%20al%202012.docx> published in Journal of Computer Assisted Learning, 2012

⁵⁵ in Education Advisory Board, op . cit

Thus edX, for example, used a press interview with its President Anant Agarwal in *The Chronicle of Higher Education* on 21 February 2013 to state its financial plans⁵⁶ but two months later had not even posted this article, the most detailed treatment to date of its revenue model, in its own press clippings gallery at <https://www.edx.org/press>.

While covering the edX story, the *Chronicle* article posted an extract from what appears to be a standard contractual document supplied by edX, detailing a template commercial agreement between EdX and University partners at <http://chronicle.com/article/Document-The-Revenue-Sharing/137429/>. In a revenue-sharing model, edX would receive the first US\$50,000 of revenue from any course it hosted, and 50% split thereafter. In a contracting model, edX would be paid US\$250,000 up front for its “production assistance” in producing a MOOC for a participating University, and repeat fees of US\$50,000 per edition of the course. If the MOOCs are financially lucrative, the edX model compares favourably for Universities against Coursera’s 85% - 91% take of income. But, the *Chronicle*’s journalist points out, there is as yet no viable proven model for any MOOC to generate significant income.

The issue has emerged in the Academic Press as a matter of concern for HEIs⁵⁷. Universities may, for example, build their own courses and host on EdX for free, but if they cannot do this, edX charges a base rate of \$250,000 per course, then \$50,000 for each additional time that course is offered, if it is preparing the content.

A comparable template partnership agreement from Coursera was obtained <http://chronicle.com/article/How-an-Upstart-Company-Might/133065/> by the *Chronicle of Higher Education* under Freedom of Information and published in an article by Jeffrey Young. The documents showed that Coursera had identified 8 possible sources of income, as follows:

- Certification (students pay for a badge or certificate)
- Secure assessments (students pay to have their examinations invigilated (proctored))
- Employee recruitment (companies pay for access to student performance records)
- Applicant screening (employers/universities pay for access to records to screen applicants)
- Human tutoring or assignment marking (for which students pay)
- Selling the MOOC platform to enterprises to use in their own training courses
- Sponsorships (3rd party sponsors of courses)
- Tuition fees.

Commenting on this list in his 2012 article *Making Sense of MOOCs: Musings in a Maze of Myth, Paradox and Possibility* (at <http://www.jime.open.ac.uk/jime/article/viewArticle/2012-18/html>) Sir John Daniel points out that the “striking feature about this list is that the

⁵⁶ http://chronicle.com/article/How-EdX-Plans-to-Earn-and/137433/?cid=wc&utm_source=wc&utm_medium=en

⁵⁷ <http://chronicle.com/article/Why-Some-Colleges-Are-Saying/138863/>

organisation least likely to make money is the partner university. The two options over which the universities have most control, certification and tuition fees, both present problems. In the case of certification [...] most participating institutions have a self-denying ordinance not to award credit for these courses. As regards tuition fees there are huge challenges of principle and practice. Is a MOOC still 'open' if you have to pay for it? Quite apart from the logistical nightmare of collecting fees in the 160+ countries where learners are registering for [...] MOOCs, it seems certain that even a nominal fee would reduce interest dramatically."

Revenues from Testing

In the literature, one of the most commented financial dimensions was the supply of testing services to EdX and Udacity MOOCs, by Pearson Vue. This inserts an optional payment gateway (\$89, charged to students) in the MOOC format. Whether a share of the testing revenues accrue to the course platform or the University provider is a point of difference between EdX and Udacity. After announcements in Autumn 2012 that this service would be provided from the Pearson network of testing centres, discussion has gone quiet. A Senior Pearson Executive approached off the record for this study reported she was not aware of how much business was coming to the company for proctoring MOOC candidates' exams.

Revenues from publishers

Publishers' business interest in MOOCs is growing and is likely to form a source of revenue.

Access to content is a factor in MOOC business models as they mature towards accredited qualifications that require access to stipulated materials of specified quality⁵⁸. Publishers have therefore been keeping abreast of the MOOC phenomenon. Technological disruption, driven partly by the rise of open access publishing, puts academic publishers in particular under pressure to reduce the cost of access to peer-reviewed journals, and experiment with new distribution channels and revenue models. One possible diversification of their services and customers is to serve content to individual learners and groups of students, including those who are not affiliated with universities, on MOOC platforms.

MOOC platforms already experiment with a variety of arrangements with publishers. *Inside Higher Education* published a short note in May 2013 listing five major publishers offering materials to Coursera users⁵⁹. Direct access to content for a standard fee, or receiving a commission on textbooks purchased by students, is one of the main sources of revenue for Coursera. This MOOC platform extracts a fee through Amazon's affiliates programme when students buy books recommended by professors.

An additional dimension of such arrangements, apart from revenue for MOOC platforms and distribution for publishers, is the boost to royalties for textbook authors. Elsevier partnered last September with EdX to provide open access to *Foundations of Analog and*

⁵⁸ A recent example is the Georgia Tech, Udacity and T&T Master's degree (<http://www.ajc.com/news/business/georgia-tech-udacity-att-team-up-for-new-tech-degr/nXttt/>)

⁵⁹ <http://www.insidehighered.com/quicktakes/2013/05/10/major-publishers-go-mooc>

Digital Electronic Circuits, a textbook required for EdX's course Circuits and Electronics⁶⁰. The textbook is co-authored by Anant Agarwal, one of the course tutors and current President of edX. The deal terms are unknown and Agarwal's rights may or may not have been monetised in this case, but such arrangements are potentially of commercial interest to authors.

A related development is Coursera's partnership with Chegg, announced this May⁶¹. Chegg is a website where students can rent, buy and sell textbooks, notes, course material and other products. Coursera's partnerships with publishers such as Cengage Learning, Macmillan Higher Education, Oxford University Press, SAGE and Wiley⁶² offer free access to e-textbooks through Chegg's DRM-protected e-Reader. Students will be able to access chapters or entire books during the course for free, but will not be able to copy-paste or print content. If they want to access the textbooks before or after the course they will have to purchase them from the publishers. In this arrangement, the Chegg e-Reader is utilising the MOOC as a market.

Revenue up, costs down: is it a business?

Literature has already seized on the lower price degrees that are starting to emerge from the pipeline as a direct result of MOOC formats with their promise of lower costs and new revenue sources.

Georgia Institute of Technology, an early experimenter in online and MOOC models, became one of the first to show what is possible, when it was forced in May 2013 to release internal papers under an Open Records Request to *Inside Higher Education*⁶³. Written up by a journalist, these planning documents give a flavour of the business implications:

“Georgia Tech expected to make millions of dollars in coming years, negotiated student-staff interaction down to the minute, promised to pay professors who create new online courses \$30,000 or more, and created two new categories of educators -- corporate “course assistants” tasked with handling student issues and a corps of teaching assistants hired by Georgia Tech who will be professionals rather than graduate students.”

In the deal with Udacity the MOOC platform, the online computer science masters programme from Georgia will be offered at \$6,630, just one sixth of its current price, to a global student roll 20 times the current size. The Georgia business plan suggests \$19 mn of revenue for the partnership in the third year of operation. Sceptical commentators and critical faculty members have seized on the reports and decried the proposed business venture for its commercial cynicism and for the low rates of pay. The Georgia Tech course is not strictly a MOOC in the pure sense of the term, but it does borrow many elements of MOOC design, including peer-grading, and the outsourcing of production and supervision

⁶⁰ <http://www.elsevier.com/about/press-releases/science-and-technology/elsevier-collaborates-with-edx,-not-for-profit-venture-offering-interactive-study-via-the-web>

⁶¹ <http://blog.coursera.org/post/collaborating-with-publishers-to-bring-courserians-more>

⁶² Coursera also announced that it is "discussing pilot agreements and related alliances with Springer and other publishers"

⁶³ <http://www.insidehighered.com/news/2013/05/28/documents-shed-light-details-georgia-tech-udacity-deal>

tasks to Udacity employees. It departs from conventional online courses and involves the creation of a new class of employees for Georgia Tech in a new salary bracket. It is the proof that engagement with MOOCs can produce innovation in learning. Evaluations of commercial benefits for Universities' Literature of financial analysis have evaluated commercial risks as well as benefits for Higher Education institutions arising from MOOC business models.

Credit Rating Agency Moody's reported on MOOCs in September 2012 and identified the upsides as follows: "MOOCs create new revenue opportunities, increase brand recognition, and provide improved operating efficiencies. The availability of open platforms enables a university to post content without incurring the cost of developing and maintaining the infrastructure." In the report, author Karen Kadem argues that in the longer term "there will eventually be negative effects on for-profit education companies and some smaller not-for-profit colleges that may be left out of emerging high-reputation online networks." The residential college model will remain viable, says Moody's, but less-selective, smaller colleges that are unable to join emerging networks or carve out an independent niche will likely experience credit stress driven by declining student demand⁶⁴.

An article in *Inside Higher Ed* on business models⁶⁵ in March 2013 pointed out that for most MOOCs, no proper financial case had been made. Identifying a stampede mentality, the article claimed that the exclusivity of Coursera's partnerships was maliciously incentivising second-tier Universities, excluded from the platform, to rush into their own MOOC arrangements on a "me too" rationale, without assessing financial parameters (or educational issues).

A broad-ranging assessment of business model issues is provided by **William Lawton and Kristina Lunt** in the 2013 article *Would you Credit that?*⁶⁶ The authors appraise the attempts by various players to develop a viable business model. Importantly, they include the ecosystem springing up around MOOCs, with entities such as Semester Online, an aggregator, getting analysis as well as the more visible MOOC platforms. These authors conclude that the case for a viable business model for MOOCs is not proven, and that it will require a prolonged process to work through the implications of the MOOC challenge.

"There will be fewer people employed in higher education and more students taught. This will suit many parts of the world very well – India's supply vs demand imbalance springs to mind. It will suit many people and institutions not at all. In terms of how we get from here to there, the smart money may be on innovations in blended learning using the flipped class model [...] Institutions that rely primarily on disseminating information (as opposed to creating knowledge) using face-to-face methods will have less recourse to such an evolution and will be subject to unceasing pressure to cut costs using the internet as a dissemination vehicle."

⁶⁴ http://www.moody.com/researchdocumentcontentpage.aspx?docid=PBM_PBM144483

⁶⁵ <http://www.insidehighered.com/news/2013/03/22/coursera-commits-admitting-only-elite-universities>

⁶⁶ Would you credit that? The trajectory of the MOOCs juggernaut. William Lawton, Kristina Lunt - The Observatory on Borderless Higher Education. http://www.obhe.ac.uk/documents/view_details?id=931

Sub-conclusion: MOOC business models

The maturing of the MOOC format is attested to in the literature by the emergent (and still incomplete) picture of MOOC models delivering falling costs and growing revenues. Whether this adds up to a viable business model is being tested with a new generation of low-cost accredited degrees based on MOOC principles being prepared by some leading US colleges.

Accreditation – a route to payment

Accrediting MOOC learning was not the most burning issue in 2012 but it appears to be set to grow in importance.

Accreditation has two aspects in MOOCland. The first is its ability to open the door to secure revenue from course fees. Second (and less discussed for the moment) is the issue of how the learning is assessed, authenticated and valued by employers.

MOOC accreditation is accelerating in the USA. Five Coursera MOOCs were recommended by American Council on Education the Accreditation body for credit awards in March 2013. Four further Udacity courses should soon receive the same status. It seems likely that accredited learning will become a MOOC norm, in the next phase of MOOC evolution.

Credit for MOOC learning has already upset other learning players, according to reports in *Inside Higher Ed* in May 2013⁶⁷. For-credit online courses provided to some 40 US Universities in a pooled arrangement called Semester Online by online course producer 2U are failing to attract students or colleges, and MOOCs are apparently the cause. The *Inside Higher Ed* journalist Ry Rivard cites a vice-provost at Wake Forest University, who comments that credit for MOOCs removes the rationale for paying fees for online courses. The attractions of 2U's offer in online format of a "high-touch faculty experience" seems not to match "the experience offered by MOOCs, which involve primarily recorded lectures and little student-to-instructor interaction". This trend, if continued, suggests that the real squeeze exerted on MOOCs may not be on the campus F2F learning format, but rather on the paid-for online formats that have emerged alongside campus learning.

Expanding beyond the elite market

Assessment of the business and commercial dimensions of MOOCs has been coloured by the fact that the main MOOC platforms have so far selected only elite academic institutions to work with. Regarding Futurelearn, a private conversation accessed by this review team established that it will select partners based on league tables. The emerging models are therefore optimised for well endowed Universities. A new twist is the decision by MOOC platforms to start to extend the format beyond elite private institutions, to encompass second-tier Universities.

The report in *Inside Higher Ed* outlined a deal in which ten middle-rank US institutions will share, co-create, buy and sell MOOC content on the Coursera platform⁶⁸. Crucially, not all of these institutions will be using the framework to offer free public access MOOCs. Many will, rather, use the MOOC as a method of sharpening up the existing campus offer.

⁶⁷ <http://www.insidehighered.com/news/2013/05/17/three-universities-back-away-plan-pool-courses-online>

⁶⁸ <http://www.insidehighered.com/news/2013/05/30/state-systems-and-universities-nine-states-start-experimenting-coursera>

SUNY (State University of New York) for example will offer credit for its MOOCs in order to allow students to reduce their enrolled time on campus, and therefore to reduce the cost of degrees.

SUNY's associate provost, Carey Hatch, said the system also plans to offer incentives to campuses to develop and consume online courses that meet general education requirements. Some courses could be “guided MOOCs” where a SUNY instructor helps SUNY students work their way through a course that was created by another institution.

Tennessee also intends to use the Coursera platform to offer traditional online courses, but differently and presumably more cheap.

Colorado University intends to use the platform as a channel for buying and selling content to extend its course offerings. This trading of content on the platform creates revenue opportunities for Coursera – a fact acknowledged by the company.

UK Accreditation debate

In the UK environment, the accreditation issue is not as pressing. Partly this is for market reasons. For Yuan and Powell in the JISC-CETIS report, (March 2013), credit is not a significant issue. They argue that “most learners using MOOCs are people who already have a degree. In this case, whether the course carries credit seems less important compared to whether they have evidence through certification that they have participated in a programme of learning and that they can present to an employers as evidence of professional development”. The composition of learners in the Edinburgh MOOCs, the UK's best documented so far, supports this view: their enrolment and completion was not geared to obtaining proofs of learning.

The UniversitiesUK report takes a more engaged stance on credentialing, although acknowledging that there is no systematic MOOC accrediting in the UK by any University yet. However, UniversitiesUK does accept the evidence that completion certificates offered by MOOC platforms are popular in the US and that many students will find it attractive to pay for them. It sees the Futurelearn proposal to offer online “badges” as a step in this direction. Course licensing arrangements, in which a HEI would purchase a license from a MOOC provider to allow its students to complete a MOOC as part of a credit-bearing programme, offer another route into both monetisation and accreditation, and UniversitiesUK draws attention to this too.

Assessment methods

The methods for assessing MOOC learning – leading to certificates and potentially to accreditation – draw on techniques developed elsewhere in online learning. There are few radical proposals.

UniversitiesUK identifies the MOOC assessment options as:

- Formal examination in a different setting is offered by VUE at licensed exam centres, in the credit-bearing MOOC model of Coursera and EdX

- In-course assessments by quizzing, multiple choice and other automated methods
- Peer assessment for more complex courses.

Validation is probably a more pressing consideration than assessment, for which proven and applicable models exist. The MOOC learner is remote, unverifiable, and identified merely by an email. Technology based solutions such as Coursera's Signature Track automated remote keystroke recognition engine may, according to UniversitiesUK, offer solutions to verify that the learner completing an assessment is who they say they are.

Sub-conclusion: Accreditation

Accreditation is discussed in the literature mostly to the extent that it offers a route to revenue for US MOOC platforms and possibly for colleges. This debate has not been seriously applied to the UK yet – but there is every reason to expect it will come.

For the time being, the models for assessing learning, that would be essential to credentialed outcomes, are not highly developed. However, some new potential methods, specific to MOOC technology, are starting to emerge.

Specific issues

Specific Issues – Education theory and practice, the ODL heritage and MOOCs

In this section

The extent to which MOOCs are a genuine innovation, or a mere repackaging of prior heritage in open learning, is a significant theme in the academic literature.

Overall, we see that a wide range of views obtain on this topic, with many competing theories and models advanced to account for different pedagogical models.

The literature on the topic of Education theory and the MOOC role in ODL which we have assessed for this review is:

- Larry **Cuban**: MOOCs and Pedagogy: Teacher-Centered, Student-Centered, and Hybrids (Part 1) 2012⁶⁹
- Etienne **Wenger**: Knowledgeability in landscapes of practice: from curriculum to identity (2011)⁷⁰
- Terry **Anderson** and Jon **Dron**: Three Generations of Distance Education Pedagogy (2011)⁷¹
- Leo **Pollack**: Escaping from the MOOC Slipstream (2013)⁷²
- Messaggi **Kaya**: Context Scenarios (2012)⁷³
- Mike **Sharples**: Learning As Conversation: Transforming Education in the Mobile Age (2005)⁷⁴
- George **Siemens**: Moving beyond self-directed learning: Network-directed learning (2011)⁷⁵
- **DeWaard et al**: Using mLearning and MOOCs to Understand Chaos, Emergence, and Complexity in Education (2011)⁷⁶

⁶⁹ <http://larrycuban.wordpress.com/2012/12/05/moocs-and-pedagogy-teacher-centered-student-centered-and-hybrids/>

⁷⁰ <http://www.lancs.ac.uk/celt/celtweb/ewenger>

⁷¹ <http://www.irrodl.org/index.php/irrodl/article/view/890/1826>

⁷² <http://www.ippr.org/juncture/171/10670/escaping-from-the-mooc-slipstream>

⁷³ <http://www.learningfrontiers.eu/?q=content/context-scenarios-task-7-2>

⁷⁴ <http://www.eee.bham.ac.uk/sharplem/Papers/Theory%20of%20learning%20Budapest.pdf>

⁷⁵ <http://www.connectivism.ca/?p=307>

Cuban of Stanford University distinguishes two opposing views of MOOCs, position in the ODL heritage:

- MOOCs are “traditional, technology-enriched teacher-centered instruction”
- MOOCs represent student-centred learning.

Cuban argues from his personal experience and research work that MOOCs will continue to conform to the teacher-centred model because:

1. lower cost of delivering professor-centred instruction in MOOCs (as opposed to face-to-face instruction) where procedural knowledge and skills are expected to be learned
2. tenure and promotion tracks in universities incentivise research rather than teaching. Professors are less likely to invest in communities of learning or to develop student-centred or even hybrid MOOCs, leaving it a heavily teacher-centred model.

Wenger (Institute for Research on Learning) for Lancaster University, analyses learning not in terms of generations of technology or method of transmission, but rather in terms of social models. Wenger identifies the learning challenge for the 21st century as one of harnessing “communities of practice” and transforming learning into a “self-governed partnership among people”. Knowledge in this view implies social bodies within communities of practice, and these entail nuanced interactions of professional bodies, teachers, research disciplines and service recipients within workplaces and professions. Competing views of practice within workplaces and professions further complexify the model, and lead Wenger to propose “geographies of competence”, which are underlying structures of meaning, locality and power that shape the social nature of knowledge. In Wenger’s analysis, MOOCs would represent a “complexifying landscape of practice”, in which new entrants such as NGOs, informal communities real and online, and technology now interact with traditional practitioners. The future of learning, he argues, is based on becoming a “learning citizen”, supported by institutions promoting knowledgeability, and to this extent MOOCs, in Wenger’s perspective, do represent an evolution of learning.

Anderson and Dron of Athabasca University, Canada, analyse three generations of distance education pedagogy in the International Review of Research in Open and Distance Learning, 2011. They consider, and then reject typologies based on the technologies used in distance education (postal education, mass media education, interactive education). They focus instead on pedagogies that defines the learning experience as evidenced in programme design. They set out a three-category typology of pedagogies in distance education:

⁷⁶ <http://www.irrodl.org/index.php/irrodl/article/view/1046/2043>

- **cognitive-behaviourist (CB)** : structured processes, explicit learning objectives and maximised brain efficiency in a didactic approach which helps learners maximise the acquisition of information
- **social-constructivist**: exploits the social bases of learning, with technology providing opportunities for learners – teacher interaction, interactions with peers, teacher interventions to facilitate learning. Scaling is difficult
- **connectivist**: learning depends on utilising connections to solve existing or emergent problems. Students need networked learning opportunities, social presence and online social capital; teachers create these online networks while students decide on the content of study collaboratively. Can be scuppered by lack of online connection, and requires charismatic leaders to facilitate learning.

Anderson and Dron propose an emerging new model, the Community of Inquiry model of ODL, which engages social, cognitive and teaching presences, and is neutral regarding technology platform and pedagogy model. They argue for the eclectic use of all the pedagogical models in order to maximise learning opportunities in the future.

Pollack in a polemic for IPPR argues that the UK's heritage in distance learning is relevant, not because of a direct transmission of approach, but because it provides two essential lessons, which should enable MOOCs to "liberate the energies of British teachers and learners". These are:

1. The MOOC platforms, like many successful ODL initiatives, began as teacher-led initiatives. Pollack argues for initiatives that devolve the clearance of IP to either the faculty or teacher, and cites Coursera as an instance of a platform that empowers teachers through a simple and direct interface
2. Previous online education offerings were constrained by predefined ideas about users and overlooked the diversity of learning impulses that online education can capture. Pollack predicts that FutureLearn's orientation more towards the manager than the user doesn't bode well in this regard.

Messaggi Kaya (Brunel University) reported for the European Forum on Learning Futures and Innovation in 2012, placing MOOCs in the context of OER and other learning models, and analysing the influence of political, economic, technological and social trends on innovation in higher education in Europe. His model identifies four higher educational institutional typologies and separates MOOCs from other ODL types as follows: (1) traditional university (face-to-face, monocultural); (2) Oxbridge model (face-to-face, heterocultural); (3) de-campus (online, mono-cultural); and (4) OERu, P2Pu, Udacity model (online, heterocultural).

Messaggi Kaya argues students are consumers looking for a value-added education and have rising expectations of delivery at a lower price. He argues that the MOOC style of higher education (OERu in his parlance) brings the following advantages over other kinds of learning: (1) convenience; (2) cost savings; (3) predictability and consistency of quality; (4) better fit to social media habits; (5) rapid, automated formative feedback; (6) flexibility in pattern of learning; and (7) transparency and control over the learning pathway.

Messaggi Kaya welcomes the possibilities of MOOCs as disruptive innovations, undercutting traditional models of education.

Mike Sharples foresaw many of the issues in 2005, writing as an e-learning scholar at the University of Birmingham (he is now an eminent professor at Nottingham University). He characterised distance education as a function of extant technologies and argued, presciently, that emerging technologies would bring challenges to the traditional notion of education, and moreover that the establishment lacked a coherent education framework to address these challenges.

Sharples emphasises the transformative effect of social networks and online communities in forming a conversation about learning. In this framework he argues that teachers are not necessarily privileged but simply part of this ongoing conversation. This represents a disruptive effect on the notion of education. Sharples predicts a new curriculum, aided by a process of negotiation and mutual agreement by teachers and learners. Sharples defines future learning as “a cybernetic process of learning through continual negotiation and exploration”.

George Siemens (Athabasca University), one of the original movers of early connectivist or cMOOCs, considers the validity of connectivism as a pedagogy model, in the context of the emergence of xMOOCs from the elite campus universities. Making the distinction between self-directed learning and network-directed learning, Siemens links connectivism to humanist roots, and stresses the growth of connections and connectedness in learning and knowledge. Self-directed learning is an incomplete concept as it only explains individual attributes of learners. He argues that in MOOCs, individual sense-making has less of a role in learning, than do the social, technological and informational networks.

Network-centric learning and knowledge-building is, for Siemens, not only a foundation for innovation, but a paradigm in the modern process of learning. He cites the discovery of the corona virus (SARS) as an example of this network-directed learning metaphor.

DeWaard et al., writing for Athabasca University’s International Review of Research in Open and Distance Learning (IRRODL), assess the complexity and disruptive potential of higher education innovations in general, such as mobile learning and MOOCs, by relating them to chaos theory. The argument is that the inherent complexity behind these technologies will drive the transformation of higher education and force the emergence of innovation. Evidence comes in part from a case study of a six-week “mobiMOOC” moderated by DeWaard in Canada.

Interpreting the “mobiMOOC” participation data through the theoretical lens of chaos theory, the authors note the following causes of disruption: (1) internal diversity; (2) internal redundancy; (3) neighbour interactions; and (4) decentralised control. The researchers argue that MOOCs can provide a means for “emergence” in higher education of innovative pedagogy.

Specific Issues – Futurelearn

Futurelearn, the UK-based MOOC platform, is will join the fray when it releases its first MOOC in September 2013. We use a primary research interview to cover it.

Simon Nelson, CEO Futurelearn Ltd., was interviewed by William Lawton, Director of the Observatory on Borderless Higher Education, and a member of this report's writing team, on 30 May 2013.

The motivation for establishing Futurelearn was clearly that the rapid development of US MOOCs had captured the imagination of UK stakeholders. This was stated in the initial media coverage. Within the UK HE sector, the possibility of achieving economies of cost had brought several key actors together. Martin Bean, Vice-Chancellor of the Open University (OU) approached Nelson in November 2012. At a meeting hosted by Secretary of State David Willetts, 'strong encouragement' had been given to the idea of a UK MOOC platform. There is no UK government funding or operational role for Futurelearn, although sources have indicated separately that the UK government could conceivably fund a Futurelearn course as part of an overseas aid programme – though that would not necessarily carry Futurelearn branding.

Futurelearn should be seen as more than just a UK-branded MOOC platform, according to Nelson. The UK HE sector has a global reputation for quality; Futurelearn will function as a platform with global relevance. Nelson sees Futurelearn as more than a MOOC platform: it is an online learning platform that will make use of non-MOOC environments. Reference points for the brand include Code Academy (a New York company that offers online tutorials for learning javascript, HTML etc. and treats coding like a game) and iTunesU (where the OU has a major presence).

The business models for Futurelearn will replicate elements of the US platforms such as certificates and exams. Nelson reports that many of the company's university partners are interested in blended learning, and Futurelearn therefore plans to monetise direct tuition and mentoring. Book purchases and apps are possibilities. Futurelearn itself will not be credit-bearing but university partners are, says Nelson, free to experiment with whatever credit regime they wish. It is fairly clear that Futurelearn partners see the initiative as an international recruitment vehicle to credit-bearing courses.

The dedicated Futurelearn team numbers 25-30 staff at present (including freelancers), and is arranged not by product or partner university but rather by functions such as product development, design, course development and commercial lead. The content lead person is the main university liaison for course delivery. The Futurelearn management board is currently constituted wholly by OU personnel but that composition will broaden. Non-university partners (British Council, British Library and British Museum) will supply content to supplement courses. It is envisaged that the British Library will supply digital archive content and the British Council may develop an examination role in the way that Pearson Vue does for the American MOOC platforms.

Asked about the possibility that Futurelearn partners could offer selected introductory courses jointly rather than as separate universities (ie, students at different universities would receive the same online portions of the courses through Futurelearn, but with different face-to-face portions in a "flipped" model), Nelson said that such an approach had

not been discussed, and he was not aware of such resource pooling operating elsewhere yet.

Nelson confirmed that Futurelearn's first courses are scheduled to launch in autumn 2013, but it appears that not all partners will offer courses at that time.

Specific Issues – FE

The application of MOOCs and ODL to the FE sector is a specific requirement of the BIS brief of the present literature review.

No coverage of this topic has been found in searching the literature in the UK. However, the authors have contacted several FE colleges and attended a conference specifically targeted at engaging FE with MOOCs.

This primary research has confirmed that, at present, MOOCs are not seen as an appropriate vehicle for any FE providers we have been able to contact.

Cautious but observing closely

A presentation at the conference *Making sense of MOOC* (ConnectEd, 24 April 2013) by Peter Kilkoynne, ILT Director at Worcester College of Technology, followed up by further discussion, elicited some data points. Kilkoynne is an enthusiast for online learning in FE, and a personal enthusiast for MOOCs, so his position can be taken as representative of the more advanced engagement in FE with the possibilities of MOOCs.

Most FE learners are vocationally-oriented 16 to 18 year-olds. "The classic MOOC model has no real place in FE", observes Kilkoynne. He believes that while the FE learner is digitally literate, in terms of study skills s/he is not independent enough to pursue a self-directed learning course.

However, Kilkoynne sees relevance for MOOCs at the margin. Staff development may be assisted. Some FE courses can be offered as tasters. Coalitions of colleges may be able to aggregate content into MOOCs even if not directed at their own students.

Kilkoynne also reports that his FE college is adopting some MOOCish practices at the margins of its teaching, and is aiming to give its learners some of the skills they might need to participate in MOOCs later. Under budgetary pressure, 15% of Worcester course content has shifted to online delivery (on Moodle) using a model of PAL (personally accountable learning). This aims not only to streamline teaching, but to develop students' skills in the emerging discipline of "learning how to learn" for lifelong learning, as learners in FE arrive from school with few or no independent learning skills. The online PAL courses emphasise personalisation, range of activities, engagement – all essential for surviving MOOCs. However, unlike MOOCs, these online courses have a linear instructivist model. Like MOOCs, they re-use existing OER such as Slideshare, YouTube, National Learning Network resources. The student outputs are also in MOOC-friendly formats (forum, wiki, reflective journal, glossary – in which students collaboratively assemble their assignments) with the concept that actions help learning. Tools learners at Worcester are expected to use include Extranormal and Go Animate.

Two other FE colleges at the “To MOOC or not to MOOC” conference confirmed that they were confident that MOOCs were not a relevant option for them.

Other innovations than MOOCs may be more useful for FE. One example is the adoption of ILRs (Individual Learner Record) on every student – a collection of data, which has been mandated by BIS. Another is the removal of requirements in regard to F2F teaching, which means colleges have fewer barriers generally to online and blended learning.

A JISC-funded initiative in Coventry, which aims to lower barriers to University entry by creating pre-University access courses, free and without entry barriers, is relevant to this issue. Coventry Open Media Classes will make undergraduate teaching resources available openly to all learners in this discipline, with a view to, among other things, extending the learning of registered undergraduate students into other learning communities.

A model for MOOC formats influencing 16-18 learning is the Cambridge Rutherford Schools Physics Project, which explicitly borrows selected methods from Coursera MOOCs to deliver pre-University content to support potentially able physics students to reach University entrance levels⁷⁷. The materials are distributed free on an online platform. The project also involves face-to-face learning and in-school support. It is not clear whether the student recruitment will be open, or massive, or whether indeed the initiative constitutes a course, but the selective and mixed adaptation of MOOC elements signalled in this project is applicable to FE.

This note of cautious FE experimentation, mixed with scepticism, should be set against other evidence that in many other ways, FE has been a nimble and early adopter of appropriate online and digital formats.

The US Community College sector – a possible model for stronger MOOC engagement

The US Community College Sector, which equates to FE in the UK, has made a more confident and well documented engagement with MOOCs.

In spring 2013, Massachusetts Bay Community College in Wellesley started to use an edX MOOC in introductory computer science⁷⁸, and reports have been filtering out slowly⁷⁹.

The Massachusetts Bay Community College (MBCC) initiative, run in conjunction with Bunker Hill Community College (BHCC), deploys a “flipped classroom” model where a MOOC from MIT provides content, but the colleges provide discussion and supervision. The Community Colleges are awarding credit and taking fees. EdX, the MOOC platform provider, calls the pilot exercise a SPOC, or “small private online course.”

⁷⁷ <http://www.bbc.co.uk/news/education-22434611>

⁷⁸ <http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html?pagewanted=all>

⁷⁹ <http://www.nytimes.com/2013/04/30/education/adapting-to-blended-courses-and-finding-early-benefits.html>

The course teaches Python computer programming. At each of the two pilot Community Colleges it is run at different paces. The Bunker Hill class moves slowly, taking two weeks on each week of MIT material. MassBay, whose students have more computer background, matches the MIT pace.

Initial results in the MassBay class report that 18 out of 19 students in the class passed the midterm exam, of which 16 were graded an A. (In the online version of the class, only 22 percent of the students got that far.) The community college students report that they like having the videos, with embedded quizzes that let them see if they are mastering the material.

A Bunker Hill student comment reported by New York Times: “The format fits me because I can watch when I have time. I can pause and rewind and play back. If you miss it in a lecture, it’s just gone.” It was also reported that for many students, knowing that the class was developed by MIT was a point of pride.

Professorial enthusiasm is also reported. “It’s not just teaching Python, it’s teaching computational thinking. I can still do things my own way, but it’s like getting a very good textbook.”

Literature on the value of online learning for FE in the US generally tends to suggest that it is of limited value to this learner cohort, even though it is being widely adopted as a means of cost-saving.

An evaluation of the challenge of distance learning in FE settings is *The Effectiveness of Distance Education Across Virginia's Community Colleges: Evidence From Introductory College-Level Math and English Courses* by [Di Xu](#) & [Shanna Smith Jaggars](#) (Community College Research Centre, 2011). Xu and Jaggars present evidence that online courses negatively impact the outcomes in maths and English courses⁸⁰. The same authors returned to the issue in 2013 in Washington State community colleges and concluded in a further study that specifically analysed the influence of online learning on course grade and student persistence. Again, negative impact was clear⁸¹. The data used in this report quantified the deficits from online learning for Community College students as follows:

“For a given student, taking a particular course in an online rather than face-to-face format would increase his or her likelihood of course withdrawal by 6 percentage points, and if the student persisted to the end of the course, it would lower his or her final grade by more than 0.3 points (e.g., from an A to an A–, or from a B+ to a B).”

Xu and Jaggars nevertheless conclude that since Community Colleges are adopting online learning in any case, as a response to cost pressures, improved design of online materials will be necessary to preserve educational outcome quality for Community College students.

⁸⁰ <http://epa.sagepub.com/content/33/3/360.abstract> and full report available for purchase

⁸¹ <http://ccrc.tc.columbia.edu/media/k2/attachments/examining-effectiveness-of-online-learning.pdf>

Sub-conclusion: FE

The literature on MOOCs and FE is sparse. However, primary research shows that the UK FE sector is adequately aware of the issue. Educational experimentation and development of online pedagogy is, however, taking other non-MOOC tracks for the time being. Marginal uses, for example in FE teacher development, and selective adoption of specific MOOC-like elements in the 16-18 sector, are emerging.

The US community college sector shows ways in which FE might exploit MOOC opportunities. These involve partnership with MOOC-producing HE.

Primary research interview

Matthew Dean, Technology Manager, Association of Colleges, was interviewed by Bill Lawton, Director of Observatory on Borderless Higher Education, and a member of the BIS MOOC Literature Review Team, on 10 May 2013. FE engagement with MOOCs is not well documented in published literature. This is to a large extent because there has been relatively low engagement. However, the FE sector is important to BIS, and developments in the US suggest there may be significant impacts for FE. Therefore, the position of FE colleges, through their representative body the Association of Colleges (AoC) is covered using primary research.

Matthew Dean reported that colleges have successfully used Moodle-based virtual learning environments (VLEs) for up to 10 years, and deploy formats such as podcasts, AV content, various forms of directed study and online assessment and text only, and they do a useful job. Matt confirmed that no sector-wide initiatives relating to MOOCs are planned. However, AoC is looking into a national strategy to use MOOCs as a delivery mechanism for the new government requirement for functional Level 2 English and Maths, which comes into effect Sept 2013.

Concerns about MOOCs voiced by AoC members include that MOOCs, because of their bandwagon effect, may become the focus of investment that cannot be mustered in the relatively cash-poor context of FE. Risks include the diversion of resources in inappropriate directions, the procurement of the wrong type of platform, or the assumption that what is effective in HE may simply be modelled for adoption by FE.

On the positive side, Matt confirmed there is a perception of MOOC as a valid pedagogical format for FE learners, and that MOOC models are applicable to FE learners. However, the caveats include the lack of unity and coherence of content across FE colleges. The sector's structural diversity is a barrier to a highly scaled operation like a MOOC.

Colleges do already make use of forms of blended and online delivery and this trend is likely to continue following the removal of the Guided Learning Hour filed from the ILR, the changes to the SFA and EFA funding methodologies and the adoption of programmes of study as a delivery model.

The UK FE community has no formal links with the American Association of Community Colleges, although it is looking to adopt a memorandum of understanding, but does seek to share best practice and common issues. It is likely that the AoC and the AACC will work more closely on the use of ODL in the future as more commonalities emerge.

HE and FE professionals participate through the Association of Learning Technology (<http://www.alt.ac.uk/>) in a MOOC aimed at those who use technology in their teaching (octel.alt.ac.uk). This MOOC has very active conversations and demonstrates a high level of awareness within the FE community of the importance of strong background levels of technology-based learning.

Specific Issues – Completion and drop-out from MOOC

The issue of completion and drop-out rates concerns many authors. The literature shows a progressive move away from comment on crude participation and completion rates, and engagement with the problem of what metrics would be appropriate for MOOCs. An accepted performance metric has yet to emerge.

Student demands in ODL were defined in 2010 in the HEFCE survey of UK ODL provision⁸² as follows:

“Student expectations are a major driver in the provision of ODL and have to be closely met in order to maintain retention rates. Most ODL students have very different expectations from a traditional campus-based undergraduate. As demonstrated earlier in this report, the majority of ODL students [...] generally expect to be engaged, challenged, consulted and supported in a ‘professional’ manner. Arguably the difference in character of this student body, as compared to traditional campus-based undergraduates, is as influential on course design decisions as the mode of delivery.”

MOOCs have arguably changed the landscape by introducing a new set of expectations, both around how students should be treated in order to be retained in an online course, and what rate of retention is acceptable.

The evidence around drop-out rates is covered earlier in this report in the survey of literature around learner experiences. This section relates to the interpretation of drop-out as an issue in MOOC contexts.

Donald Clark, formerly CEO of the e-learning agency Epic, argues in his blog that drop-out rates are not a useful way to assess the MOOC model:

⁸² <http://www.jisc.ac.uk/media/documents/projects/UKOnlineLearningStudy-FinalReport-Mar10-FINAL-FORPUB.pdf>

“MOOCs must not be seen as failure factories. They must rise above the education models that filter and weed out learners through failure. Good MOOCs will allow you to truly go at your own pace, to stop and start, go off on an exploratory path and return again. This is what true adult learning is and should be. I always drop out of learning experiences as I never go on formal courses. I decide when I’ve had enough. They should not copy but complement or construct new models of learning”.⁸³

General perspectives on MOOC drop-out rates are provided by **Clay Shirky** (technology writer based at NYU and prominent critic of US education models) who points out that in the vast majority of US colleges (away from the elite institutions) drop-out rates of 50% and over are common, and this is the experience of some 90% of US learners⁸⁴. MOOCs, by this standard, do not do so badly on drop-outs; and those who drop have lost no time or money by doing so.

An attempt to aggregate the completion data is made by **Katy Jordan**, an analyst and blogger, whose specialist blog MocoMoocher has been active since July 2012 providing detailed commentary. Pulling numbers from www.class-central.com Jordan concludes that “completion rates can approach 20%, although most MOOCs have completion rates of less than 10%”⁸⁵. Jordan’s interactive online diagram allows sifting of results by various input data. The higher levels of completion appear to be for autograded courses with cohorts of between 40,000 and 60,000 learners, but there are not many clear indicators of which parameters predict higher completions. Jordan also observes that data submission is not comprehensive, and that data definitions are not uniformly applied.

Kop and Fournier analysed patterns of non-participation in MOOCs as early as 2010 in their article *New directions to self-directed learning in open networked learning*⁸⁶. Their study explores theoretical models for describing learner autonomy, and applies these to a MOOC to categorise types of self-directed learning that were observed among learners. They argue that “lurking”, previously seen as a sign of non-participation, acquires a new significance in MOOC courses as a self-directed learning style.

Sue Gee in *MITx - the Fallout Rate* (2012)⁸⁷, an article on the I Programmer blog site, tackles the seemingly high drop-out rate associated with MOOCs by analysing student statistics of a particular MITx course (6.002x, Circuits and Electronics). This MOOC, led by Anant Agarwal, attracted 154,763 registrants, of which 7,157 completed and were awarded certificates. Gee analyses where drop-offs occur. 55% of participants actually dropped out even before the course started. Gee attributes this to signing in using multiple e-mail accounts, or discovering the difficulty of the course. Further drop-offs occur after the first problem set (69,221 participants taking, 26,349 participants getting at least one point), the midterm (10,547 participants taking, 9,318 passing) and the final (8,240 participants taking, 5,800 passing).

⁸³ <http://donaldclarkplanb.blogspot.co.uk/search?q=dropout>

⁸⁴ <http://www.theawl.com/2013/02/how-to-save-college>

⁸⁵ <http://www.katyjordan.com/MOOCproject.html>

⁸⁶ <http://selfdirectedlearning.com/documents/Kop&Fournier2010.pdf>

⁸⁷ <http://www.i-programmer.info/news/150-training-a-education/4372-mitx-the-fallout-rate.html>

Gee's main findings are: (1) drop-outs declined from the midterms to the final; (2) there were high passing rates for midterms (88%) and the final (70%). Gee makes the argument that MOOCs should aim for large enrolments and disregard drop-outs, because those who drop at an early stage have made a minimal investment.

In terms of policy development, Gee suggests that given the interest that a course like this MOOC generated, courses at lower levels could help in lowering initial drop-out rates.

Edinburgh University data on MOOC participation and drop-out

Some of the most up-to-date and granular data on participation and drop-out has emerged from Edinburgh University's Coursera-based MOOCs. The University published its first phase interim report based on its first six MOOCs which ran from March to April 2013⁸⁸ and is reported in full earlier in this document.

Edinburgh's lead in publishing openly its completion data does suggest a possible positioning for UK HEIs around MOOCs, to do with openness and transparency. Data on MOOC learner performance from US institutions, and from the platforms themselves, is published increasingly rarely. By focusing on the completion and achievement end of the process, Edinburgh has redefined the debate from one about drop-outs, to one about completion.

Sub-conclusion: MOOC drop-out and completion rates

Authors addressing this topic argue from a variety of perspectives that the high crude drop-out rates of MOOCs are an irrelevant issue, despite the frequent reference to these numbers in popular discourse.

Reasons include the high drop-out rate in many types of learning, and the evidence that with no penalty for exit or entry, lapsing from MOOC enrolments is simply not a significant decision.

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<http://www.era.lib.ed.ac.uk/bitstream/1842/6683/1/Edinburgh%20MOOCs%20Report%202013%20%231.pdf>

Specific Issues – Technology

Stanford's Education School has positioned itself as a centre of expertise for an emerging discipline, closely linked to MOOC affordances, in which data technology and education practice merge. "Education Science" as it is called is aired in the Stanford discussion series Education's Digital Future (<http://edf.stanford.edu/>). Mitchell Stevens, a Stanford sociologist and one of the founders, believes that Stanford's work on MOOC data will help researchers "to know the extent to which digitally mediated college experiences will deliver the same returns as a four-year residential experience". (Nature, <http://www.nature.com/news/online-learning-campus-2-0-1.12590>)

A computer science perspective on MOOCs from two Stanford University professors writing in 2013 for the Association for Computing Machinery journal Communications of the ACM⁸⁹ <http://cacm.acm.org/magazines/2013/2/160160-reflections-on-stanfords-moocs/fulltext> draws attention to the high quality of online education technologies existing for many years before MOOCs commanded headlines.

Taking a US-centred perspective, authors Cooper and Sahami reference the Stanford Center for Professional Development (SCPD) offer of distance-learning courses via television microwave channels from 1969 onwards. These course offerings evolved to using streaming video via the Internet and electronic assignment submission and distribution of course materials.

The 2008 launch of Stanford Engineering Everywhere (SEE <http://see.Stanford.edu>) open course, while not itself novel (MIT's OpenCourseWare project was created years prior to SEE) established a new level of response to open online materials, with course lecture videos that have been viewed more than *two million* times on YouTube alone. The authors note this strong response occurred without any of the affordances of MOOCs (such as enrolment, quizzes and assessments, assignment deadlines, statements of accomplishment etc). It is, in this critique, the addition of such packaging features that allowed the current set of MOOCs to cross a line from being considered yet another free educational *resource* to being viewed as scalable free *courses*. Again emphasising the legacy of previous learning technology, the authors highlight intelligent tutoring systems and educational data mining techniques developed in traditional online courses, and endorsed for their validity in large metastudies of online learning efficacy⁹⁰. The incorporation of MOOCs into "flipped classrooms," which existed in various forms before MOOCs, is also highlighted. Within their own computer science discipline, the authors cite five online learning tools which, they state, are equally promising environments for student learning.

Assessing the technology achievements of contemporary MOOCs, the authors highlight as their main novelty the opportunity to collect unprecedented volumes of data on students'

⁸⁹ Reflections on Stamford's MOOCs, Steve Cooper, Mehran Sahami. Communications of the ACM, Vol. 56 No. 2, Pages 28-30. 10.1145/2408776.2408787

⁹⁰ U.S. Department of Education, Office of Planning, Evaluation, and Policy Development. Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies, Washington, D.C., 2010

interactions with learning systems. In this context, the MOOC, combined with machine learning technology, is an enabler of insight on and progress in personalised human learning.

The argument from technology by Cooper and Sahami tends to suggest that the legacy of online learning established in the decades prior to the dawn of MOOCs, is the essential foundation of the affordances of the new format.

MOOCs and data analytics

A MOOC operator's perspective on data and measurement comes from Diana Oblinger, editor of the 2012 Educause report *From Metrics to Analytics, Reporting to Action: Analytics' Role in Changing the Learning Environment* written by Linda Baer and John Campbell⁹¹. Oblinger adopts a twenty-year perspective on how tools have transformed data-driven industries from metrics to analytics. She affirms University education is also subject to this change, under pressure from learners and funders to demonstrate quantitative improvements in outcomes. Oblinger argues that:

“Leading the institution from metrics to analytics and reporting to action will require a significant institutional shift [...] to develop analytics or “actionable intelligence” in all institutional areas—particularly in learning analytics.”

Her discussion references several ways in which analytics will significantly improve success for all students, including simplifying the registration process; accelerating the time to degree completion; blocking schedules with fixed, predictable classroom meeting times; forming peer support and learning networks; embedding remediation into the regular curriculum; and reducing time in the classroom through the use of online technologies.

Analytics therefore herald a disruptive innovation and a break with current practice and will deliver new ways to serve the student, faculty, and administrative users in radically different ways. Innovations to be expected from growing analytics capability in the Academy include, according to Oblinger,

- Utilising “social” data to better understand student integration into campus. As the use of social media continues to increase, one could imagine mapping social connections to determine which students are having difficulty with connecting to the institution.
- Emergence of adaptive learning. If efforts to use analytics to predict success proved fruitful, the next significant step would be to use analytics to power adaptive systems that adapt to the learner's needs based on behaviours of the individual as well as of past students' patterns.
- Mapping to interventions. Analytics can link suggested interventions to the use and impact of the interventions. If the intervention suggested utilising the “math help

⁹¹ From Metrics to Analytics, Reporting to Action: Analytics' Role in Changing the Learning Environment written by Linda Baer and John Campbell

desk,” did the student use the resource? If so, for how long and while doing what activities?

Perspectives such as Oblinger’s do demonstrate the extent to which disruptive innovations driven by technology can continue to transform educational outcomes, whether or not MOOC formats are deployed by institutions.

This is a futuristic scenario which forecasts educational techno-bliss in the same rosy terms as MOOC enthusiasts might use – but without reference to MOOCs. Oblinger hails these transformations: “Technologies currently exist that would allow students to map their educational starting point and destiny, determine how many educational units per dollar they are getting with their funding and how much time is left on their educational journey, interpret the academic gas tank indicators, and compare how they are stacking up against the educational norm during all points of their journey.”

However, Oblinger’s manifesto for an analytics-based revolution has to some extent been overtaken by events in MOOCland. These analytics-based optimization techniques are already deployed in MOOC platforms. It may be that the MOOCs ability’s to Hoover all educational innovations into its space is a defining characteristic.

Fournier, Kop and Sitlia presented the possibilities of utilising learning analytics in order to drive improvements in pedagogy in personalised learning environments such as MOOCs. Their paper, *The Value of Learning Analytics to Networked Learning on a Personal Learning Environment* (2011)⁹² argued that learning analytics are not just useful for academic managers and instructors, but also for learners in order to provide feedback on performance as well as their learning styles. Their interpretation is supported by a study of learning behaviour in connectivist MOOCs. The learning analytics for the MOOCs considered by the authors quantified types of participation from students, helping to distinguish active “repurposing” material from more passive “consuming”. The use of learning analytics provided rich sources of information about learner activity, key words that anchored the course, and tracked activity outside the learning environment such as Twitter posts. It also revealed the kinds of contributions made, as well as the knowledge, ideas, thinking, information, tools and experiences that promoted learning. Nonetheless, the authors stressed that despite the possibilities offered by learning analytics, there was still a need for human interpretation, contextualising, and capturing contextual nuances in data.

⁹² <http://nparc.cisti-icist.nrc-cnrc.gc.ca/npsi/ctrl?action=rtdoc&an=18150452>

Sub-conclusion: learner analytics technology

Learner analytics technology, already theorised and explored in a mature and established debate rooted in the ODL literature, comes to its full potential with the scale and mechanisation of MOOCs.

Applications will enable students to be served more engaging material based on their individual profiles. Adaptive learning is a real possibility. Interventions can be targeted to secure completion.

Specific issues – MOOCable skills in learners

Literature on online and networked learning generally, and on MOOCs to some extent, identifies a significant issue around the skills and capacities of learners to participate in and benefit from the MOOC experience.

This literature is associated particularly with authors within the cMOOC tradition, who first identified that the web literacies for participation and dialogue and connecting in social media were essential to positive learning experiences, but were not widely present in many student populations, and were often gender and class related. The literature identifies these problems not just in MOOCs but in a wide range of networked online activities, of which MOOCs are a subset.

The xMOOC strand of MOOCs has attracted less commentary on this. Its proponents, arguably, have less interest in drawing attention to barriers to learning in MOOCs. Additionally, its pedagogic model is instructivist and therefore the online projection skills are less crucial.

Literature discussing this issue includes:

- Dana Boyd: *Streams of Content, Limited Attention: The Flow of Information through Social Media* (2010)⁹³
- Debra Ferreday and Vivien Hodgson: *The Tyranny of Participation and Collaboration in Networked Learning* (2008)⁹⁴
- Rita Kop: *The challenges to connectivist learning on open online networks: Learning experiences during a massive open online course* (2011)⁹⁵

⁹³ <http://www.educause.edu/ero/article/streams-content-limited-attention-flow-information-through-social-media>

⁹⁴ http://www.networkedlearningconference.org.uk/past/nlc2008/abstracts/PDFs/Hodgson_640-647.pdf

⁹⁵ <http://www.irrodl.org/index.php/irrodl/article/view/882/1823>

Dana Boyd (Research Associate for Harvard, Microsoft Social Scientist) writing in *Educause Review* gives a broad background account of how information and learning take place in connected society. It does not mention MOOCs specifically but has undoubted relevance for MOOCs. Boyd identifies the concept “flow” present in current social media networks where individuals seem to be perfectly attuned to information circulating online. She puts forward the argument that online living is within in a “stream” of information, and we possess the potential to add, consume and redirect it to other purposes. This requires, she asserts, a paradigm shift in how we view sites of information (such as MOOCs). They are not a destination, but rather part of a process that requires the production of even more information.

Among a range of theoretical issues, Boyd raises the challenge of homophily, or the phenomenon in social networking where people with the same interests and backgrounds often end up connecting with each other. This may lead to the reinforcement of social divisions online, unless online destinations provide connections that will foster democratic discourse.

Boyd uses the metaphor of “streams” of information to identify skills that individuals and firms will require in the future in order to adapt. Technological innovations may also enable people to contextualise information. Boyd also predicts the monetisation of sociality, in which the capacity of online spaces to “host” people and their social interactions becomes a point of value.

Ferreday and Hodgson of Lancaster University argued in 2008, in the context of networked learning generally, that the notion of networked learning as a liberating force allowing for greater participation is utopian. They recast networked learning as having a “dark side”, one that can lead to majoritarian tyranny, isolation, oppression and control. Using a case study of a part-time MA in Management Learning and Leadership (MAMLL) - a programme with an expectation of participation – the authors identify a “tyranny of participation”, and draw attention to an alienated minority in the programme, deemed “uncooperative” and “unsupportive” by their peers. Ferreday and Hodgson argue that rigid insistence on community norms such as “support” became a source of exclusion to others.

Rita Kop (National Research Council of Canada, for Athabasca University’s International Review of Research in Open and Distance Learning) takes a critical view on claims of greater self-directed learning in MOOCs. She argues that connectivist learning in MOOCs requires a high level of individual autonomy and self-direction in order to maximise learning opportunities in the network. Furthermore, a high level of online presence is required in order to create meaningful connections that can foster learning. Moreover, learners themselves are required to possess a high level of critical literacy necessary in filtering and making good use of online materials.

Kop reports a mixed-methods research project examining the experience of MOOC participants in the context of these challenges. She reports that many participants did experience a significant shift towards self-directed learning. Kop, however, identifies the issue of “lurkers” in the network as both a threat (lack of participation) and a reality (lurking as a valid learning choice). Creation is an essential activity for connectivist learning, and Kop reports low levels of product creation by students. She also calls for further exploration to understand how to foster the “creation” type of activity theorised in the

connectivist model. Essential literacies for MOOC learning are skills of creativity, critical thinking, collaboration and research.

Sub-conclusion: MOOCable skills for learners

A consistent diagnosis is made in the literature of a potential lack of, or poor distribution of, the particular networking, reputational and learning skills that MOOC environments require for successful learning. Online autonomy, group formation and inclusion/exclusion feelings among learners, are a vital dynamic in MOOC learning, and are probably insufficiently understood. It is also likely that primary and secondary education curricula are not addressing these learning skills adequately.

Part Three: Conclusions and recommendations

Policy Development

This MOOC literature review raises potential policy development areas in three ways:

- Formal overviews have made systematic presentations of ranges of policy areas affected by MOOCs, which are cited
- Polemical and essayistic exchange has charted specific policy issues, which are cited
- The review authors have sifted the literature, and made assessments based on BIS criteria, the literature, and their expert judgment.

Systematic policy overviews are attempted by the following publications which are all assessed in this report

- JISC-CETIS
- UniversitiesUK
- Austrade
- MOOC Model (Canada's SSHRC)
- IPPR.

Emerging from these formal systematic reports are the following areas of clear consensus around policy issues:

1. "Wait and see" is not a viable policy for Universities (or Education Ministries). Disruption to demand and supply of education is very likely although estimates of the severity and timing of the disruption vary. In the face of MOOCs' scale, visibility, and connection to a gamut of existing sensitive policy issues in an already teetering Higher Education world, policy around MOOCs has the potential to be an influential instrument. (IPPR, Austrade, Canada-SSHRC, JISC-CETIS)
2. MOOCs are not an isolated issue but rather they catalyse and focus issues around the gamut of pre-existing policy concern in higher education (around state financing, access, student finance, teaching and research quality, institutional restructuring, internationalisation etc). To a significant extent, these ongoing issues may increasingly be viewed through the lens of the MOOC format and its promises of

access, innovation, “cheapness”, scalability and other apparent advantages. (IPPR, Austrade, JISC-CETIS, UniversitiesUK)

“MOOC developments [give] policy makers [...] opportunities to advance education missions, drive student recruitment and internationalization, and develop new pathways into higher education” (UniversitiesUK)

3. Globalisation of higher learning content, and accreditation systems, will be accelerated by the borderless format of MOOCs. Issues of international recognition, and state funding for Universities’ cross-border activities, will arise. (IPPR, Austrade, JISC-CETIS)
4. The MOOC format makes new demands on students’ learning skills, especially around information literacy. Schools, higher education, and adult learning (including lifelong learning and CPD) will need to form self-motivated, innovative active agents who are confident in large networks, and able to function in a reputational economy, if they are to thrive in the MOOC-shaped educational landscape. (IPPR, Canada-SSHRC)
5. Universities face a critical challenge in how they respond to MOOC opportunities (which will implicate many other issues they face). How they negotiate MOOC-driven disruption around income, access, curriculum, certification, and the challenge from non-educational providers (Pearson, Google etc.) will determine their capacity to innovate and survive. The Universities’ list of MOOC policy issues, according to UniversitiesUK report, covers sustainability, pedagogy, credit and capacity. (JISC-CETIS, Austrade, UniversitiesUK)
6. Accreditation of learning is the coming big issue as MOOCs worldwide (and other educational innovations) start to become vehicles for certified attainments. Quality and accountability will be significant issues for both institutions individually, and UK Education as a global brand. In the words of the JISC-CETIS report, “At a national and international level, new frameworks for HE funding structures, quality insurance and accreditation to support different approaches and models for delivering higher education will be required” (JISC-CETIS, IPPR).

Single policy issues which arise out of the more spontaneous literature reflect and echo these consensual points to some degree. However, some additional concerns, often linked to particular viewpoints, are worth noting. Here is a selection.

- The problems of quality evaluation between MOOCs
- The need to reform the skillset and curriculum for U-18 education
- The possibility of education technology as a bi-partisan issue in national politics
- The potential for MOOCs to disrupt the certified CPD industry

- The potential for MOOCs to disrupt the lifelong learning and adult learning sectors.

Literature discussing government policy specifically includes:

- Kevin Carey: Obama, Rubio Agree on One Thing: Technology Could Fix the Higher Ed Mess 2013⁹⁶
- Jim Soulsby, Adult learning in the UK is in a policy vacuum (2013)⁹⁷
- Darrel Steinberg (California State Deputy)⁹⁸.

Darrel Steinberg, a state legislator, launched a California law bill in March 2013 to force state colleges to give credit for online low cost courses (i.e. MOOCs) where popular courses are oversubscribed. Faculties would have to nominate approved online providers (StraighterLine, Udacity and Coursera were mentioned) to top up provision, when the campus institution could not meet demand at scale.

While these coercive and radical proposals from Steinberg will probably not become law any time soon (the California teaching unions are a bulwark against change), the development illustrates the kind of pressures that can be brought to bear on the education establishment by policy makers. Arguably, Governments have a role ensuring that consensual and rational policy evolution takes place, to forestall confrontational and ideology-driven policies.

Kevin Carey in his polemical article for *Slate*, a political magazine, highlights the apparent consensus between US Democrats and Republicans for lowering the cost of higher education through federal funding of online programmes such as MOOCs. Referring to a policy paper in which the Obama administration proposed the allocation of performance-based federal funding to a wider range of higher education providers including online course providers, Carey notes the support of Republicans such as Marco for student aid to individuals who enrol in online programmes.

Carey attributes the consensus to the phenomenal growth of MOOCs and their potential to break the traditional monopoly by higher educational institutions on instruction and state funding. Carey argues that MOOCs offer a rare bi-partisan option for both Democrats and Republicans as they seek to widen participation in higher education and reduce its costs.

Jim Soulsby (who works for the UK's Association for Education and Ageing) diagnoses a "policy vacuum" in an article written for the Lifelong Learning programme of the European Union. Soulsby portrays a picture of British adult learning as the preserve of higher social

⁹⁶http://www.slate.com/blogs/future_tense/2013/02/13/state_of_the_union_moocs_obama_rubio_agree_on_using_tech_to_fix_higher_ed.html

⁹⁷ <http://www.infonet-ae.eu/en/background-reports/adult-learning-in-the-uk-is-in-a-policy-vacuum-1273>

⁹⁸ <http://www.insidehighered.com/news/2013/03/13/california-bill-encourage-mooc-credit-public-colleges>

classes. He also notes a static or declining offer of programmes, and of participation. In the available programmes, Soulsby identifies problems with the labour market, and with the skills deficit orientation of adult learning. He argues for policy to approach to adult learning much more explicitly and clearly.

These three contributions by Steinberg, Carey and Soulsby illustrate the potential for specific beefs and grinds within education politics to hijack the MOOC train and re-orientate it to single-issue or one-dimensional causes. This is, arguably, a reason for Government to keep the initiative in policy development.

The Present Literature Review Authors have distilled the literature, BIS requirements, and their own expertise into three suggested areas for policy development, which are given below. Our criteria are: work with points of consensus identified by the literature review, go with the momentum, take the easy opportunities first.

1. **Accreditation.** This issue is already being successfully pushed by the major xMOOC players (Coursera, Udacity). Peer assessment is emerging as a robust form of learning validation. Viable authentication tools are on the technology horizon. Policies could go with the momentum of this, and use MOOCs as a vehicle to address rigidities and bottlenecks in accreditation, allowing innovative learning formats to provide certified transferrable credit. UK arguably has an inbuilt global advantage here, as an innovator and global kitemark for quality in certification, and as home to a strong culture of critical peer assessment. There is potentially a monetisable market for licensed peer assessors, which might provide a commercial focus for policy direction.
2. **Address CPD.** MOOCs have so far attracted casual and curious learners, but predominantly those with qualifications for whom the MOOC is a voluntary CPD activity. Policies addressing the sector of commercial and not-for-profit CPD provision (*which in any case faces several challenges*) could encourage innovation in CPD, and develop a monetisable source of activity for MOOC producers. Up to now, the policy issues catalysed by MOOCs have been seen as the province of HE, but it is inevitable that the format will come to disrupt the CPD industry. Encouraging an orderly transition of the market, for example sponsoring a MOOC model for a significant CPD area (e.g. accountancy, veterinary) would be a way to bring forward change.
3. **Innovating Pedagogy.** There is an opportunity to exploit the consensus that MOOCs drive innovation in learning. Whether the MOOC format stalls, or continues to accelerate, and with or without accreditation, MOOCs mark the coming-of-age of the digital toolset in learning. Web and Social Media tools (forum, wiki, bulletin board, content trackers) are now as central to learning as the lecture theatre and campus infrastructure. Policy can score easy wins by acknowledging and encouraging this, celebrating successful use of network technology in learning, and foregrounding online literacy. Some visible and symbolic adoptions in Government training (Civil Service training provision etc.), and perhaps even some A-level curricula, would be a plausible way to signal this.

Recommendations for further research

The Literature surveyed for this project describes a wide range of possible further research areas. To some extent, the need for further research is self-evident in a rapidly evolving field where many questions have not been answered.

Themes identified for investigation by authors reviewed include:

- Disruptions to the HE infrastructure (Austrade, Pearson/IPPR)
- Relevance of the MOOC model outside communities of IT-literate high achievers (Shirky, Legon)
- International Issues: problems of extending beyond US (Graebel) and into Developing World (Trucano) and coping with globalised competition (Olds)
- Systems of accreditation (McAuley)
- Digital Literacy requirements in a MOOC-shaped future (Pearson/IPPR, Kop, Boyd)
- Pedagogy: how MOOCs complement/challenge F2F (Rivard, Education Advisory Board, deWaard, Sharples, Siemens)
- Use of MOOC environments by whole classes (MacLeod)
- Using analytics for improving completion rates (Hill, Lytics Lab).

As a commentary, we would suggest that in any event many of these fields for research identified in literature will be naturally progressed by the MOOC community. The energy of its commentariat, and the innovation of its players, will resolve many questions faster and more decisively than formal research programmes.

As a point of comparison, the Austrade report makes a number of further activity recommendations for government-sponsored activity in Australia. These are:

- Research among employer groups on the acceptability of credentials and accreditation earned through MOOCs
- A survey of the impact of education technologies in Australia's top emerging education markets
- Workshops with US stakeholders (partnering US HEIs is identified as a helpful tactic for Australian HEIs)
- Dissemination of messages about MOOCs to Australia's Future Unlimited teams (an innovation network similar to BIS's ICT Tomorrow)
- Invitation of responses to its report.

Formal research would make sense only where BIS sees benefit from knowing the destination before the herd gets there. We believe UK HE and FE sectors face significant risks or opportunities around MOOCs, worth investigating and understanding in advance, in the following MOOC-driven questions:

- Potential disruptions in the HE sector, particularly overseas HE sales
- Technology solutions for accreditation, assessment and authentication.

Disruption

MOOCs will disrupt business as normal in several domains of HE activity. Undergraduate teaching and recruitment, pedagogy, commercial CPD, and most particularly international recruitment and reputation may be sharply affected. This is a view shared by nearly all authors (notably Pearson/IPPR, Austrade, UniversitiesUK, McAuley, Sharples). There will be opportunities to both gain and lose positioning.

Possible research to control these risks:

1. Develop knowledge and experience inside UK Academy about using MOOCs to preserve or increase earnings from overseas learners, and in commercial CPD
2. Studies of non-UK MOOC users to understand how and why perceptions might favour UK MOOC brands.

BIS-sponsored research projects in these areas could take the following forms:

- a) A best-practice observational account of UK and non-UK MOOCs, from both learner and provider perspectives, to establish features that are perceived as UK differentiators in MOOC environments
- b) A sampling of MOOC users in non-UK key educational export territories (Gulf, Asia-Pac, India etc.) with longitudinal tracking, enabling understanding of key markets
- c) An awareness initiative in the CPD sector, possibly around the stronger CPD focus of Euro MOOCs.

Technology Development

The competitive advantages of MOOCs provided by UK HEIs or on UK platforms would be increased by a technological lead in the following areas:

1. Adaptive learning driven by learner analytics
2. Badging and Accreditation technology. This could be not merely about course content achievements, but also about learning-related skills such as reputational impact in social media
3. Authentication technology (Retina, keystroke, challenge) which would leverage the robust and proven peer assessment methods.

BIS-sponsored research projects in these areas could take the following forms:

- a) Technology studies including horizon scans to identify technology candidates, gaps, timescales, risks and leading players
- b) Technology stimulus initiatives such as those run through KTN to encourage partnerships to address technology challenges, and holders of relevant technology to develop MOOC applications
- c) Sponsor or participate in a MOOC on developing educational technologies.

Annex

Rest of World round-up

Developing World and globalized access to high quality learning

In this Section

MOOCs as an adjunct to the Development process have polarised opinion between those who identify them as direct access to global quality education, versus those who detect a new form of cultural imperialism.

Meanwhile, MOOC development outside the anglocentric hothouse of US-Canada-UK-Australia, is characterised by strong involvement with professional needs, wide experimentation, and enthusiastic engagement in all significant geographies.

Initiatives in using scaled open learning to address Developing World needs have a significant heritage. The Open University's initiatives HEAT and TESS in delivering healthcare and teaching professional skills using IT and mobile platforms in Africa have created important learning and evidence. Other players such as Development Charities (Practical Action, for example) have succeeded in using free open learning resources to achieve development goals.

Literature considering MOOCs in a global development context points to two sides of an issue of access and equity.

On one side, MOOCs are hailed as a cost-free access to excellent resources and learning experiences for students in less educationally privileged geographies, notably India, China and Africa. An example would be the [Financial Times](#) front page story "Developing world's prodigies take online course to leading colleges"⁹⁹ in which the New York correspondent hailed the achievements of Amol Bhave, a 17 year-old from Jabalpur, India, who gained entry to MIT after an exceptionally strong performance in the edX Circuits and Electronics MOOC. Interviewing Bhave, the FT quoted his view that MOOCs would have a strong impact in India. Bhave's excitement was located in the emergent and hands-on nature of the experience – "seeing experiments performed in front of you" in his words.

Alternatively, MOOCs with their high demands for connectivity, online literacy, and English language skills, may be excluding developing world students and privileging learners from the most highly developed educational environments.

⁹⁹ Financial Times, 27 March 2013, Andrew Edgecliffe-Johnson, *Developing world's prodigies take online course to leading colleges*

For this review we have considered the following literature on the topic:

- Michael Trucano: Making Sense of MOOCs (2013)¹⁰⁰
- Michael Trucano: Missing Perspectives on MOOCs (2013)¹⁰¹
- Jessica Leber: In the Developing World, MOOCs Start to Get Real (2013)¹⁰²
- Kris Olds: Are MOOCs becoming mechanisms for international competition in global higher ed? (2012)¹⁰³

Michael Trucano, World Bank resident Education Technology specialist, reviews the MOOC phenomenon from the perspective of Development.

In one article Trucano identifies African pilot applications (<http://blogs.worldbank.org/edutech/moocs-in-africa>) as well as reporting that the World Bank's internal training provider World Bank Institute <http://wbi.worldbank.org/wbi/> will use a MOOC platform to provide internal training courses for policymakers. In the Bank's pilot MOOC application, Coursera units are integrated into a Tanzanian project to provide missing IT skills demanded by employers. The project is due to launch in 2013.

Trucano elsewhere reviews the relevance of MOOCs in Developing Countries at (<http://blogs.worldbank.org/edutech/MOOC-perspectives>). He describes the emerging response to the phenomenon in Less Developed Countries, and identifies more risks than upside. On the upside, Trucano says MOOC formats may offer developing world Universities a means to unbundle "long-standing dissatisfactions of various sorts with the current educational status quo at the higher education level". These include access to other learners, learning materials, experts and respected qualifications. Reporting the risks, Trucano identifies critics who have expressed fears that MOOCs may be

"yet another wave in cultural imperialism from the 'North' and the 'West' crashing across borders, washing over (or possibly washing out) local educational institutions, cultural norms and educational traditions."

Trucano additionally identifies an increasingly vocal critique

"of a markedly two-tier system of global higher education, with a small number of elites able to participate in education the 'old-fashioned way' in small, intimate, face-to-face groups in close physical contact with their professors, while the vast majority of students, especially those in developing countries, have to make do with participating in a watered down, inferior educational experience delivered through MOOCs."

¹⁰⁰ <http://blogs.worldbank.org/edutech/node/686>

¹⁰¹ <http://blogs.worldbank.org/edutech/MOOC-perspectives>.

¹⁰² <http://www.technologyreview.com/news/512256/in-the-developing-world-moocs-start-to-get-real/>

¹⁰³ <http://www.insidehighered.com/blogs/globalhighered/are-moocs-becoming-mechanisms-international-competition-global-higher-ed#ixzz2TNYQvP9T>

Jessica Leber in the MIT Technology Review considers the “spill over” of MOOCs to the developing world in the light of LDC’s lack of learning infrastructure. Leber notes the apparent potential of MOOCs to “democratise” education with the promise of free access to top-notch courses offered by elite institutions globally. However, she identifies technical obstacles, mainly the lack of computing infrastructure and bandwidth that renders streaming of course content almost impossible. There are also cultural barriers: to address LDC learners’ needs, MOOCs would need to be tailored to a more diverse worldwide audience, not the Westernised Anglophones currently served.

Leber references attempts to address these issues. Tweaks are being made onto MOOC platforms which would enable students from developing countries to download, instead of stream, course content. EdX is reported to be exploring ways to open source its software, allowing more universities to post online courses and customise interfaces in a way that reflect the technological affordances of their locales. Efforts are underway to launch French-speaking courses for Francophone Africa, led by the École Polytechnique Fédérale de Lausanne in Switzerland.

Leber reports an alternative “hybrid” classroom model of MOOC application being used in India to “massively empower” classes. MOOCs are mined as repositories of lectures and quizzes for Indian engineering students belonging to different institutions. A Microsoft project also looks into skimming content from e-textbooks and pairing. In Rwanda, the establishment of an entirely MOOC-based university is being attempted, in which students could access modules from a Harvard social justice MOOC, and an Edinburgh critical thinking MOOC.

Leber points out that until experiments such as these have been proven viable, MOOCs cannot claim to provide education for all.

Kris Olds for the Inside Higher Education blog site addresses the role of MOOCs in international higher education competition. He diagnoses increasing polarisation between European and American camps.

Assessing FutureLearn, the OU-based MOOC platform, he notes it poses as a European product, while appearing to base itself mostly on innovations from the United States. He contrasts this to Udacity which has German, Dutch and Taiwanese professors teaching a course, and Coursera’s global reach beyond the US, to Universities in Hong Kong, Switzerland and UK. He argues that the potential of FutureLearn to become a global player will be indicated by its ability to integrate its offering with Universities in continental Europe.

Europe/Germany/France

We present a factual roundup of selected MOOC offers in continental Europe. Continental Europe MOOC activity, while not highly visible on a co-ordinated Europe-wide scale, has nevertheless in some centres been aggressive. The innovations in these settings have been primarily pedagogical but have also made headway in terms of business model and technology. The display of flexibility, simplicity and self-organising among professional MOOCs is instructive.

Individual, single-course MOOCs have been run in Europe from early 2012. Some centres are well advanced – Helsinki University is presenting its 41st MOOC in July 2013.

Leuphana University, a public institution in Northern Germany, ran a MOOC on the ‘City of the 21st Century’ from January to April 2013 (<http://digital.leuphana.de>). Chaired by architect Daniel Liebeskind, the MOOC attracted participants from 91 countries. It ran on a bespoke platform called Candena Scholar, apparently constructed in Lüneburg, probably with European funds. The format is more cMOOC than xMOOC. Among its supporters (in cash, apparently) is Xing the professional introduction network (German equivalent of LinkedIn) which suggests that the US xMOOC model in which recruiters are connected to MOOC organisers in a financial transaction may also be viable in cMOOC.

École Polytechnique Fédérale de Lausanne (Switzerland) EPFL launched a 7-week MOOC on Coursera on programming skills in March 2013¹⁰⁴ and offers four other Coursera MOOCs with a further 15 in development as of 15 May 2013¹⁰⁵. EPFL MOOCs use the English language. With 150,000 students having registered for its MOOCs to date, EPFL has emerged as a focal point for debate about a European stance on MOOCs and is proposing in the first EuroMOOC conference to investigate whether “Europe needs its own MOOC platform”.

One of the EPFL MOOC professors published comments and reflections at the French site *MOOC.fr – L’actualité des MOOC francophones*¹⁰⁶ and reported that the MOOC had been completed by 400 internal EPFL students, and 3,600 outside students. The outcome for the external students was that 70 sat the final examination and 40 passed it, of whom 15 did so “with distinction”. A survey of the EPFL students showed that a majority welcomed the MOOC but a quarter did not wish any more of them. Nevertheless, EPFL is committed to further MOOCs and will explore in particular how the internal EPFL students can receive a differentiated course which is better than the free and openly offered version.

The first French MOOC to complete (and so far the only completed one) is a course to improve techniques in online learning (*ITYPA: Internet Tout Y Est Pour Apprendre*). It ran from October to December 2012 (<http://www.itypa.mooc.fr/>) and was completed by one thousand learners. It has attracted only slight mention in the French literature¹⁰⁷. Its declared method is clearly aligned to the cMOOC model, being built by and for its participants, and explicitly espousing Connectivist principles in its literature.

“Chaque semaine, nous aborderons une nouvelle thématique. Quelques ressources vous seront proposées pour amorcer les échanges. Les apports, lectures et propositions de chacun viendront les enrichir. Un résumé de vos productions sera proposé chaque jour, sous forme de newsletter (pardon pour l’anglicisme mais certains seront difficiles à éviter).

Enfin, pour conclure la semaine, une réunion hebdomadaire en ligne aura lieu le jeudi soir à 18:00 (heure de Paris). Elle nous permettra de faire le point sur le

¹⁰⁴ <https://www.coursera.org/course/progfun>

¹⁰⁵ <http://actualites.epfl.ch/index.php?module=epflfiles&func=getFile&fid=16285&inline=1>

¹⁰⁶ <http://mooc.fr/blog/histoire-dun-mooc-analyse-numerique-pour-ingenieurs/>

¹⁰⁷ http://sticef.univ-lemans.fr/num/vol2012/15r-rosselle/sticef_2012_rosselle_15rp.html

sujet et de profiter de la synthèse d'un expert du domaine. Cette réunion sera enregistrée pour ceux qui ne peuvent se libérer. Rendez-vous en direct ou en différé sur la chaîne Youtube du cours. ”¹⁰⁸

[TRANSLATION : Every week we will take up a new theme. Some resources will be set to get the debate started. The contributions, readings and ideas of every learner will help to enrich them. A summing up of your outputs will be offered every day, in the form of a newsletter (apologies for the Anglicism, but some words are hard to avoid). At the end, to close the week, a weekly online meeting will take place at 18.00 Paris time. This will allow us to get to grips with the topic and to benefit from a pulling-together of things by an expert. This meeting will be recorded for those who aren't free to join. Drop in directly or time-shift on the course YouTube channel.]

The promoters of this Franco-MOOC have no academic backing, only a few of its organisers have University affiliations, and it is mounted on an improvised community platform in a connectivist spirit to pursue professional dialogue. A second MOOC for ITYPA is under discussion but no dates given for production.

A listing site for upcoming French MOOCs (which includes Canadian MOOCs in French) at <http://www.MOOC.fr> shows that the emerging French language MOOC offer has a decidedly vocational spin. IT, Finance and Project Management are represented, and the majority of the dozen courses listed for summer 2013 have professional themes. An example is the Sorbonne University MOOC on business law, due to present in September 2013 (platform unspecified).¹⁰⁹

Europe-wide initiatives

In a more recent wider initiative, the European Association of Distance Teaching Universities (EADTU) has joined with partners in 11 countries to launch the first pan-European MOOC, which has the support of the European Commission. At the platform's launch towards the end of April 2013, partner institutions (mostly open universities) were drawn from France, Italy, Lithuania, the Netherlands, Portugal, Slovakia, Spain, UK, Russia, Turkey and Israel. A further nine institutions from 6 other countries are expected to join. The available literature on these initiatives is sparse, and mostly takes the form of official announcements¹¹⁰.

As is common among other MOOCs, there is a wide range of disciplines available. Courses include mathematics, economics, e-skills and e-commerce, climate change, cultural heritage, corporate social responsibility, the modern Middle East, language learning and fiction writing. Unlike the larger US platforms, courses are offered via the partner institutions' own learning platforms, with the OpenupEd website (<http://www.openuped.eu/>) acting as a portal. At the time of writing the more detailed descriptions of the platform's key features remain undefined; however, it is likely that the pedagogy on offer will vary across courses.

¹⁰⁸ cited in Baron, G-L, *A Propos du MOOC, quelques exemples*. 2012 retrieved at <http://www.adjectif.net/spip/spip.php?article188>

¹⁰⁹ <http://www.e-cavej.org/5/73/le-cavej-mooc-sorbonne-droit.html>

¹¹⁰ http://europa.eu/rapid/press-release_IP-13-349_en.htm

OpenupEd has provided some indication of their accreditation and funding models. It is suggested that 'all courses may lead to recognition', for example with a completion certificate or a credit certificate that may count towards a degree. The latter option will come with a cost attached: ranging from €25 to €400, depending on the course length and institution.

Courses are provided in the 11 languages of the initial partners, plus Arabic. However, of the 61 courses listed in OpenupEd at the time of writing, nearly 70% are either in English (23) or Spanish (19), largely drawn from two large distance-teaching institutions - the Open University and Universidad Nacional de Educación a Distancia.

Microsoft Professional MOOCs

The adoption of MOOC formats by Microsoft for professional training is taking root, and appears to be happening mostly outside the US-UK sphere.

Microsoft Germany has launched a Windows-8 MOOC¹¹¹ on the opencourseworld platform in Germany at www.opencourseworld.de.

At Visvesvaraya Technical University (India) Microsoft is also launching a pilot MOOC offering free teaching in analysis and algorithms¹¹² which leads to a certificate. This focus on core theoretical skills, rather than applied business techniques, suggests a clear role for MOOC formats in complementing Higher Education content. Microsoft Research India's boss is enthusiastic about MOOCs, has extended the pilot across 27 different technical universities, and is offering a prize of 10 internships to the best students. The connection of MOOCs to recruitment, an approach mooted in USA but not yet delivered at scale, is noted.

First Asian MOOCs

China's official position on MOOCs is not reflected in any academic literature we have been able to identify.

However, a 2013 report in University World¹¹³ covered Coursera's planned Chinese-language MOOCs on Chinese history from National Taiwan University and one on Chinese opera from the Chinese University of Hong Kong. This report confirmed that Coursera had held discussions with Chinese Universities, and Coursera's Andrew Ng has addressed Beijing University on the topic of MOOCs. However, political control was potentially a show-stopper. *"Individual Chinese professors may be allowed by the authorities to put courses on Coursera, but*



¹¹¹ http://www.microsoft.com/germany/msdn/aktuell/news/show.aspx?id=msdn_de_49180

¹¹² http://articles.timesofindia.indiatimes.com/2013-05-14/education/39255221_1_anisha-ghosh-rai-chakrabarti-moocs

¹¹³ <http://www.universityworldnews.com/article.php?story=20130417153545600>

universities would have to cooperate with an official version sanctioned by the Chinese government, a source in Beijing said". Hong Kong University of Science and Technology has committed to MOOCs with Coursera but in the English language.

One of the authors of this review has addressed the Chinese Distance Learning Community on the subject of MOOCs, using the magazine "Distance Learning in China" – which has the world's largest readership for any title on the subject. Several Chinese Universities have since approached this author for advice and consultancy on MOOC development.

Development seems likely in the course of 2013-4, as China has a thriving e-learning industry which is keen to globalise.

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